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No. 3721

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(Revised June 16, 1915.)

FOURTEENTH ANNUAL REPORT

OF THE

STATE BOARD OF HEALTH

OF THE

STATE OF CONNECTICUT,

FOR THE

YEAR ENDING NOVEMBER 30, 1891.

WITH THE

REGISTRATION REPORT FOR 1890 RELATING TO BIRTHS, MARRIAGES, DEATHS AND DIVORCES.

PRINTED BY ORDER OF THE LEGISLATURE.

NEW HAVEN:
TUTTLE, MOREHOUSE & TAYLOR, PRINTERS.
1892.

State of Connecticut.

OFFICE OF SECRETARY OF STATE BOARD OF HEALTH,
NEW HAVEN, CONN., Dec. 1, 1891.

To his Excellency, Morgan G. Bulkeley, Governor of Connecticut :

SIR : In compliance with the laws of the State, I have the honor to present to you the Fourteenth Annual Report of the State Board of Health for the year ending Nov. 30, 1891, and also the Registration Report of the Bureau of Vital Statistics for the year ending December 31, 1890.

Very respectfully,

C. A. LINDSLEY, M.D.,

Secretary of State Board of Health and Superintendent of Registration of Vital Statistics.

MEMBERS OF THE BOARD.

	Term Expires.
Hon. ALFRED E. BURR, Hartford, - - - - -	1895
Dr. N. E. WORDIN, Bridgeport, - - - - - -	1893
Prof. WILLIAM H. BREWER, New Haven,† - - -	1891
GROVE H. WILSON, M.D., Meriden, - - - - -	1895
Hon. ELISHA JOHNSON, M.D., Hartford,* - - -	1893
RALPH S. GOODWIN, M.D., Thomaston,† - - -	1891
Prof. CHARLES A. LINDSLEY, M.D., New Haven.	

OFFICERS OF THE BOARD.

Hon. ALFRED E. BURR, President.

Prof. CHARLES A. LINDSLEY, M.D., Secretary and Treasurer.

Prof. HERBERT E. SMITH, Chemist.

State Superintendent of Registration and Vital Statistics.

Dr. C. A. LINDSLEY, as Secretary of the Board.

Chemist.

Prof. HERBERT E. SMITH, M.D., New Haven.

* Deceased.

† Under the law, holding over until their successors are appointed and qualified.

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GENERAL REPORT.

To his Excellency, Morgan G. Bulkeley, Governor of Connecticut.

SIR :—The State Board of Health herewith presents the fourteenth Annual Report of the Board, as required by Section 2583 of the General Statutes.

The work of the Board during the year has been pursued on the same general lines, as in previous years.

A system of communication with the local boards throughout the State, established some years ago, has been carefully cultivated and encouraged, until now the State is enabled, through it, to keep more or less regularly informed of the general condition of health in the commonwealth.

The statutes establishing the State Board evidently contemplate such intercourse, although it is nowhere made the positive duty of officials to maintain a regular correspondence, or even to make any report of the work of local boards to the State Board.

Sections 2578, 2579 and 2580, make it the duty of both State and Local Boards to communicate with each other on special occasions ; but those occasions are not frequent enough to keep the State Board satisfactorily informed of the state of health in all the towns and the influences which affect it, hence it is that the "information" which the State Board might give and the aid it might offer, cannot be always seasonably rendered.

Fortunately during the past year there have been no severe and fatal epidemics among the people of the State. There have been numerous local outbreaks, of nearly all the more common infectious diseases. The constant and widespread intercourse of the people of Connecticut with the people of other States and countries, maintains an uninterrupted liability to the invasion of such infectious diseases, and in fact, we have had contagious disease imported during the year into Connecticut from even so remote a distance as the State of Texas.

It is reasonably to be counted as no small part of the good work of both the State and Local Boards of Health, that upon

the outbreak of any of these diseases in a town or village, such precautions are immediately taken and such information made public by the health authorities that the outbreak is in most instances limited to the first case or cases or to the families in which they first appeared.

There have been not a few instances in which disease has occurred, of a type so malignant that the majority or all the children in a family have perished, and yet the disease has not been permitted to invade other families.

A very marked improvement in hygienic administration has been observed in this regard, in many towns in the State. It is the opinion of the Board that this advance is due in large part to the operation of the law enacted in 1887, which makes it the duty of health boards in every town, annually to elect a Health Officer or a Health Committee, to whom are delegated, by the same Act, all the powers of the Board.

This fixes the responsibility upon individuals chosen for that duty. The former law put the work of sanitary administration upon a mixed body of men, who were elected for very different functions, and were only Health Officers *ex-officio*. The influence of the new law is steadily growing in good results.

Personnel of the Board.

There has been no change in the membership of the Board during the year except that caused by the death of the Hon. Elisha Johnson. The two members whose terms of office have expired in 1891, by the terms of the charter, hold over until their successors are chosen and qualified in their stead.

The Health of the State.

The year 1891 was not marked by any important or severe epidemic; and yet the average health of the State was not so good as for several years previous to the invasion of our whole country by the influenza in December, 1889. Although the severity of that disease in its specific form, was of short duration, but few typical cases being observed after February of 1891, yet it seemed to have made an impression or left an influence in its train in consequence of which the mortality from other diseases seems to have been conspicuously increased. It was made the

subject of a special investigation which was published in the last Annual Report.

It is in order briefly to mention the more frequent diseases, of the contagious or infectious character to which the people of Connecticut are exposed.

These interest boards of health most deeply, because the spread of such diseases, it is always possible to restrict or control, and therefore gives to health officers frequent occasion for prompt, active and decisive duty.

Small-Pox.

The whole number of cases which were reported to the Board during the year was four only. Three of them were in Greenwich. They occurred in March. Two of these were children and the disease was so mild that it was mistaken for chicken-pox. In due time the grandfather was taken down with small-pox and then the diagnosis of the cases of the children was reconsidered, and it was concluded that they had varioloid. Further investigation made it evident that a Texas soldier, a member of the family, just returned, had brought the infection. The grandfather died.

The other case was in Waterbury, taken sick the 8th of April, in the person of a young woman 22 years old who had been working up to April 2d in the Springdale Paper Mill at Westfield, Mass.

Small-pox is not endemic in Connecticut, and all the cases which may in future occur within her borders will, like the last, result from importations of the infection from abroad.

The total number of deaths from small-pox in Connecticut since 1880 has been as follows :—

Years.	Deaths.	Years.	Deaths.
1880	9	1886	0
1881	31	1887	4
1882	9	1888	3
1883	8	1889	0
1884	0	1890	12
1885	0	1891	1
		Total in 12 years	76

In compliance with a mutual agreement among the State and Provincial Boards of Health made at the International Conference of Boards of Health at Toronto, Oct. 6, 1886, this Board has been

notified of the occurrence of small-pox in the following states and provinces during the year.

Florida.—One case at Jacksonville, in April, 1890. Origin not ascertained. Varioloid—cicatrices of a previous attack of small-pox. Case promptly cared for, all precautions taken, and no report received of subsequent cases there.

Illinois.—Two cases in April, at Sparta, children never vaccinated, origin, St. Louis, imported home by the father of the children.

Another case a week later, man, non-resident, took the disease in St. Louis.

Iowa.—One case in May at Council Bluffs, a railroad employe, origin unknown.

Massachusetts.—One case in April, at Holyoke, origin, probably paper mill rags.

Another a week later at Greenfield, a tramp from Canada, origin not otherwise known.

Another in July, a child of 4 years at Pittsfield.

Michigan.—One case in August, man 23 years old sick at Cheboygan, origin not reported.

Another in September at St. Joseph, man 25 years old, origin not reported.

Minnesota.—One case of variola, bell-boy at a hotel in St. Paul and 3 cases of varioloid, all cared for promptly at St. Paul's Hospital. These were in June. In August 4 more cases in St. Paul, origin not given.

New Jersey.—Reports have been received of 25 or 30 cases in that state, chiefly in Trenton and Newark, without particulars.

New York.—One case at Jamestown, Jan. 27. Origin traced to Newark, N. J. From this case, in about two weeks, 6 new cases developed in Jamestown.

North Carolina.—At Lexington, June 5th, two cases, origin unknown.

Ohio.—One case at Urbana, January 23, non-resident, in route from Jennings, Louisiana, stopping at New Orleans and Cincinnati. Another at Cleveland, May 18th, non-resident, just arrived from Chicago. Two others, Nov. 29th, one at Cincinnati and one at Glendale, origin unknown.

Pennsylvania.—One case, Jan. 21, at Scranton, letter carrier, supposed to have been contracted in handling the mails. One at Erie, Jan. 24, a teacher, origin unknown. Eight cases at Jonson-

burg, viz: one, Feb. 4th, three on the 9th, and four on the 13th, origin unknown. Another case at Pittsburg, Feb. 13th, contracted from the case above mentioned at Jamestown, N. Y. Two more cases at Ridgeway, cause not reported and three cases in Philadelphia, a mother and her two children, origin unknown. Still another, Nov. 16th, at Mt. Pleasant, supposed to have been contracted in Trenton, N. J., Nov. 23d, and an infant in the same house, also another case at Morrisville, imported from Trenton, N. J.

Tennessee.—One case, May 18th, a child at Knoxville, origin unknown. June 9th seven additional cases all living within forty feet of each other and taken from the first case. Another case in District 12, County of Obion, no history given. Still another, Nov. 26, at Memphis, originating in Cairo.

Wisconsin.—One case at Prairie du Chien, a recent arrival from Texas, reported Jan. 31st, 1891. From this case within four weeks originated 10 additional cases with 3 deaths. Another case April 21st at Wright's Ferry, no history given. From this case another occurred in the same family June 6th.

Province of Quebec.—Cases at Grosse Isle, quarantines, June 1st. A case of varioloid at Sheppington, March 25th, origin uncertain. June 9th a case at Montreal, sailor, origin unknown. On Nov. 3d, 1891, the following statement of the prevalence of small-pox in the province was received.

A Short Sketch of the Present Outbreak of Small-pox in the Province of Quebec.

On the 8th of September a female servant named Bujold employed in the family of Mr. Chabot, Richelieu Street, Quebec, having felt unwell for several days and an eruption appearing on the skin, went to the Hotel-Dieu hospital for advice. The physician there being unable to diagnose the case ordered the girl, as a precautionary measure, to be placed in a room by herself until the following day. The girl, however, managed to leave the hospital and crossing over to Point Levis took the Intercolonial cars to Dalhousie that evening and at Dalhousie embarked on the steamer "Admiral," arriving at her home at Carleton, County of Bonaventure, at 9 o'clock A. M., Sept. 9, where her case was afterwards recognized as small-pox. The disease declared itself ten or twelve days afterwards in a house at Carleton, at which the

girl had stopped for a short time on her way through the village to her father's house after leaving the boat. These were the first cases reported to the Provincial Board. Later the Provincial Board of Health of New-Brunswick reported a case in Dalhousie, that of a sailor employed on the "Admiral."

A well qualified medical inspector was at once dispatched by the Provincial Board with instructions to see that the local Board was doing its duty in the matter of isolation, vaccination and disinfection, and to return on the track of the girl Bujold in order to discover, if possible, the source from which she had been infected.

Cases having been reported at St. Paul de la Croix, and at St. Damase, the Inspector was telegraphed to call there on his way back to Quebec, these places being only a few miles distant from the Intercolonial Railway line. Both these outbreaks occurred from direct contact with the girl Bujold on the cars. The gravity of the St. Paul de la Croix outbreak is explained by the fact that the persons infected on board the cars by the girl Bujold went to a social gathering in the Post-Office House the night of their arrival at St. Paul. Cases resulting from contact with her on the boat were subsequently reported from Pabos, Newport and Shoolbred and are being well looked after by the local boards.

The cases of spreading from parishes originally infected are two cases at St. Clement, a parish adjoining St. Paul; four cases at Ascot, near Sherbrooke, in a family returning home from St. Damase; and one case at La Jeune Lorette, in a washerwoman's family, which resulted from infected clothes brought from the Cabot house, in Quebec, before it was quarantined.

On the return of our Inspector to Quebec and on his going to the house in which Bujold had resided, he discovered a child with small-pox well developed, and shortly afterwards another child in the same house took the disease; both were unvaccinated and both died. On continuing his search, our Inspector found that a nurse named Gale, attached to the Jeffrey Hale Hospital, had been seized with small-pox and had been removed from the hospital to a house in Richelieu Street some two doors from the house in which Bujold afterwards fell sick. Further investigation proved that another nurse from the same hospital, named Macpherson, had been laid up with small-pox and had been sent away from the city to a neighboring village to be treated. These

two cases had not been reported so far as the Inspector could learn. It further transpired that a male employe of the hospital had shortly before died of an eruptive disease which the Provincial Board has strong reasons for believing was small-pox. A prior case yet fully investigated appears to have been in the hospital in the person of a sailor or a man employed about the harbor. It is possible, but not yet proven, that this case resulted from the steamer "Brazilian," which was quarantined at Grosse-Isle, in June, and which after having landed her sick and having been disinfected, proceeded to Montreal, where a case of small-pox was discovered on board. This vessel stopped at Quebec on her return trip, and some of the sailors, it is reported, went ashore and sold clothes to second-hand shops.

The following statement of the progress of the epidemic was made December 2d, 1891.

BOARD OF HEALTH OF THE PROVINCE OF QUEBEC,
Montreal, 2d December, 1891.

Counties.	Municipalities.	Cases since outbreak.	Deaths.	Recovered	Still sick.
	Quebec City	5	3	2	0
Bonaventure	Carleton	9	1	8	0
do.	Shoolbred and Nouvelle	3	0	3	0
Rimouski	St. Damase	17	5	11	1
Témiscouata	St. Paul de la Croix	60	10	50	0
do.	St. Clément	8	0	8	0
do.	Ile-Verte	1	1	0	0
Gaspé	Pabos	6	1	5	0
do.	Newport	6	2	2	2
Sherbrooke	Ascot	8	3	1	4
do.	Sherbrooke City	8	2	1	5
Quebec	La Jeune Lorette	4	0	4	0

Yours respectfully,
ELZÉAR PELLETIER, *Secretary.*

The foregoing reports illustrate very forcibly two things: 1st, the highly contagious character of the disease, and the readiness with which it can be transported to the most remote distances. 2d, the importance of giving the public the benefit of the doubt in every questionable case of irruptive disease. Small-pox is fortunately now of such rare occurrence that many of the younger members of the medical profession have never seen a case. It is, therefore, in no respect discreditable to their professional acquirements to confess a doubt in any case of an eruptive fever in

which they are not sure of the diagnosis. If in such instances the skin affection resembles the description of a variolous eruption in any degree it is their duty to the public to take the same precautions as if it were true small-pox until the question is settled.

Hydrophobia.

Only one death from hydrophobia was reported in the State during the year.

The following interesting report of the case was kindly sent to this office by Dr. Geo. R. Shepherd of Hartford:

HARTFORD, April 2, 1891.

My Dear Dr. Lindsley:

Miss L., aged 51, was very slightly wounded by a pet dog on the fore-finger of the right hand on the 11th or 12th of March. The dog had been ill for several days and under the care of two veterinary physicians of this city, who pronounced her disease to be severe ovarian trouble, although she had some difficulty in swallowing and an occasional spasm. The dog died quite unexpectedly to the veterinary after about two weeks' illness. On the 25th inst., at tea time, Miss L. found it difficult to drink her tea and later in the evening had severe palpitation of the heart and great oppression of the chest. The use of a fan or a draught of air brought on spasms of the chest and neck. Her convulsions were relieved at first by $\frac{1}{4}$ gr. dose of morphia and $\frac{1}{150}$ gr. of atropia hypodermically, but these soon required to be repeated every hour or two, and later on 40 gr. doses of chloral by enema were given. She lived $2\frac{1}{2}$ days and during that time took $7\frac{1}{2}$ gr. of morphine, $\frac{1}{4}$ gr. of atropia, and 200 gr. of chloral, and died exhausted from the frequently recurring convulsions notwithstanding.

Yours, etc.,

GEO. R. SHEPHERD.

During the year 1878 there were registered in Connecticut seven deaths from hydrophobia, but since that date, during a period of twelve years only 6 deaths have been reported from that cause.

The following table shows the years in which it has occurred since the registration of vital statistics has been under the supervision of the State Board of Health.

Years.	Deaths.	Years.	Deaths.
1878	7	1886	0
1879	2	1887	0
1880	1	1888	1
1881	0	1889	1
1882	0	1890	0
1883	0	1891	1
1884	0		
1885	0	Total in 13 years	13

during which there was an interval of seven years without any deaths.

Typhoid Fever.

This disease has occurred in a large number of the towns and cities of the State. The mortality attributed to it during the year in the monthly reports is something less than in the two previous years. Of the large towns, including a city within the town limits, the highest death-rate from this disease was in Norwalk, being 6.2 in every 10,000 of the population. Next, the towns in the following order, Waterbury 5.4, Danbury 4.6, Hartford 4.1, while in New Haven it was only 1.9.

For the whole State there were 3.3 deaths to every 10,000 of living people. Taking the towns of 5,000 population and over, and comparing them with the other towns in the State, it is found that in these two classes of towns, each taken as a whole, the death-rate from typhoid fever is not appreciably different.

The jealous watchfulness with which every independent American citizen regards every seeming infringement upon his personal rights, hinders the effective operation of measures, which are well known preventives of the spread of typhoid fever, and which, if well employed, would in a few years do as much towards the extinction of that disease as they have done for small-pox.

Diphtheria and Membranous Croup.

The deaths from these diseases have also been less numerous by a small number than the average for the last 10 years. These diseases are now endemic and prevail in every part of the State. They are contagious and infectious. The persistent vitality of the infection is such and the facility with which it may be conveyed from place to place so great, that only by the most thorough application of disinfectants can their prevalence be arrested after they have once broken out in any place. This last remark is equally true of scarlet fever.

Scarlet Fever

Has been quite generally prevalent through the State. But the mortality has not been so large as it was previous to 1886. The type of the disease seems milder than in former years.

MEASLES.

Measles has been exceptionally light or infrequent. There were only 18 deaths. The average mortality for the last ten years was 59.

Among the papers published with this Report will be one on a widespread outbreak of typhoid fever, occurring among the guests of a hotel at a popular resort. One of the peculiarities of this outbreak was that none were taken sick until they had returned to their homes. And thus it affords a curious instance of typhoid fever originating in one locality from a given water supply, and the victims separating during the stage of incubation to widely distant parts of the country, and suffering simultaneously from the fever. The investigation of this outbreak was made by Prof. H. E. Smith, M.D., of the Medical Department of Yale University, and his report shows how skilfully and energetically he has pursued the chain of circumstances to its reasonable conclusion.

Another paper of great and general interest is by Dr. Louis S. DeForest, of New Haven.

It is an original and very instructive paper, founded upon a careful investigation of the prevalence and existing conditions of tuberculosis in New Haven during a period of 15 years. A special study has been made of the frequency with which the disease has recurred in the same dwelling houses.

There will also appear an additional report on the "Pollution of Streams."

This will show the first results of an investigation, conducted at frequent and regular intervals for two years, of the condition of the surface drinking waters of the State.

With regard to certain qualities of water, such as hardness, amount of chlorine present, and other inorganic constituents, every locality has its own standard of purity. Hence in order to judge whether a given specimen of water is defiled or not, it is necessary to know what the standard of water is in the locality from which the water was taken.

It is a trite saying that a spring cannot rise higher than its source; it is equally true that a spring cannot be purer than its source.

The committee have only been able to test the quality of the waters in a few places during the two years. They have been examined not only chemically for impurities, but also microscopically, and in the bacteriological laboratory, to determine the amount and kind of animal or vegetable life contained in them.

The specimens examined have been taken from widely different portions of the State. The examinations from each source of supply have been repeated every month to determine the variations occurring at different seasons. They have been obtained chiefly from the public supplies of the cities and large towns.

Most public water supplies are more or less subject, at irregular intervals, to the growth of organisms, which temporarily render the water offensive, both to taste and smell. It is very desirable to keep these under observation for a still longer period, with the purpose of determining the conditions upon which their growth depends, and if possible, what means may be used to prevent their growth.

The studies of the committee making this report have been confined to a few of the public water supplies of cities and dense populations. But a large part of the people of the State inhabit the rural districts and must depend chiefly upon wells and springs. It is a matter of deep importance to them to know the condition of their wells. As the surface waters in different parts of the State have each their respective standards of natural purity, so also has the ground water, which is the source of supply in wells. It is therefore a matter of no little concern to the residents of country places to have an investigation of the natural quality of the water which their wells afford. Indeed, there are many reasons why it is to be much regretted that the work which has been so well begun should be interrupted for want of an appropriation by the State to carry it on.

MEETINGS OF THE BOARD.

HARTFORD, CONN., Jan. 31, 1891.

The regular quarterly meeting of the State Board of Health was held this day at Hartford in the Capitol. Meeting called to order at 2.30 P. M.

The President being absent Hon. E. Johnson was chosen to preside. There were present Prof. Brewer and Drs. Wilson, Goodwin and Lindsley.

The minutes of the last meeting were read and approved. The Treasurer made report for the quarter ending Dec. 31, 1890. The report was approved and ordered on file.

The Secretary presented several communications which received the respectful consideration of the Board, but gave no occasion for any special action. An invitation to appoint delegates to attend the Seventh International Congress of Hygiene and Demography, to be held in London in August next, was laid upon the table until the next meeting.

The Secretary was appointed to attend the National Conference of State Boards of Health, to be held in Washington in May next.

Voted, That the Secretary subscribe for eight copies of "Sanitarian" for the use of the members.

The report of the Secretary was then read and accepted and ordered on file.

The Committee on Legislation raised at the last meeting, made report that they had considered the subjects suggested at that meeting by the Secretary, and would recommend that the Secretary be instructed to have bills prepared to submit to the Legislature on the following subjects:

1. Notification of contagious diseases.
2. Annual reports from local Boards of Health.
3. The burial of the dead upon removal permits.

The report of the Committee was accepted and the Secretary was by vote so instructed.

The Secretary stated that he had received official information that the Board of Health of Simsbury had failed to organize,

and moved the appointment of Dr. C. M. Wooster as Health Officer for the year at a salary of $50. It was so voted.

The Secretary informed the Board that no official notice of an organization of the Board of Health of South Windsor had been received, and moved that Dr. T. S. Hodge be appointed Health Officer for that town at a salary of $50. It was so voted.

Dr. R. S. Goodwin, as delegate to the A. P. H. A., made report of the meeting.

No further business offering the meeting adjourned.

Attest: C. A. LINDSLEY, *Secretary.*

SECRETARY'S REPORT

For Quarter ending December 31st, 1890.

The general health of the people of Connecticut during the last quarter, as indicated by the reported mortality, has not been so good as the average state of health for that season.

The total deaths reported to this office were 2,927. This is 237 more than the average for the fourth quarter of the previous five years. The number is also higher than in any single year in the previous five.

As compared with the quarter ending September 30, the deaths were 659 less. It must be borne in mind, however, that the three months from July 1st to October 1st, are the sickly months of Connecticut, and always have the largest mortality. The year 1890, however, was an exception, the mortality in the first quarter, on account of the epidemic of influenza, exceeding that of every other quarter of the year. In comparing the causes of death in the two quarters of the last half of the year, it is interesting to note how much they differ. This is readily shown by the monthly statement made to this office by the town registrars of vital statistics.

During the third quarter of the year there were 917 deaths attributed to diarrhœal diseases, while in the fourth quarter there were only 88. On the other hand, during the third quarter there only 158 deaths from pnuemonia and bronchitis, while in the last quarter there were 348 ascribed to those diseases. Diphtheria also, which is a disease generally affecting the respiratory organs, was 65 per cent. more fatal in the last quarter than in the previous one.

In examining then, the mortality from diseases of those two sets of organs, the intestinal and the pulmonary, we can account

almost entirely for the difference in the total deaths in the third and fourth quarters of the year.

The total deaths for the whole year, as reported in the monthly statement, numbered 13,320, which exceeds any previous mortality in one year in the history of the registration of the State. It is the general belief among all who have given the subject thoughtful attention that the great epidemic at the beginning of of the year, was so baneful in its effect upon human life as to cause this excessive mortality. Yet as a direct cause of death La Gripp was only certified to as such in 69 instances.

The work of the Board during the quarter has been chiefly of routine character. One special meeting was held on the 4th of October at Bristol, by the invitation of the local authorities to confer with them and their engineer, Mr. McKenzie, in regard to the permanent disposal of the sewage of the village.

The members of the Board were met at the Bristol depot by a committee of the citizens, and carriages being provided, the whole company proceeded to inspect some of the present methods of disposal, and then were taken along the proposed route of the sewer to the fields upon which it was intended to dispose of the sewage by broad irrigation. Mr. McKenzie, the engineer, explained sufficiently at length the details of the plan. An excavation in the ground exposed the character of the soil upon which the sewage was to be thrown.

After making careful observations of the existing conditions, the Board held a consultation and instructed the Secretary to communicate in writing to the Committee of Bristol its approval of the proposed method of caring for the sewage of the village.

C. A. Lindsley, *Secretary*.

QUARTERLY MEETING.

April 8, 1891.

The meeting was called to order at 2.30 P. M. at the usual place in the Capitol by the President, Hon. A. E. Burr.

There were present Prof. Brewer and Drs. Wilson, Goodwin, Wordin and Lindsley.

The minutes of the last meeting were read and approved.

The report of the Treasurer was read, his vouchers submitted and audited, and the report accepted and ordered on file.

The appointment of Dr. Hodge to be Health Officer of South Windsor was reconsidered, the Board being informed that Dr. Hodge had removed from that town.

Several communications received the respectful consideration of the Board.

The report of the Secretary for the previous quarter was read, accepted and ordered on file.

The Committee on Legislation reported that several bills had been prepared relating to sanitary legislation and to the better registration of vital statistics. Copies of these were submitted to the Board. There being no prospect that any immediate action would be taken upon them, by the Legislature, the committee was continued.

The following minute was directed to be entered on the records, in reference to the death of the late member of the Board, the Hon. Elisha Johnson.

It is with saddened hearts and a deep sense of a great loss that we announce the death of our late colleague, the Hon. Elisha Johnson, who died on the 18th of February, 1891.

Mr. Johnson was appointed as the legal member of the State Board of Health by Gov. Waller, in 1884, to fill the vacancy caused by the death of the Hon. A. H. Lippitt, of New London.

During all his connection with the Board he has ever been faithful to his duties, prompt and regular in his attendance to the very last, and unflagging in his interest in the work in which the Board is engaged.

The members of the Board had learned to rely upon his sagacious counsels and his matured judgment with unquestioning confidence in all matters requiring legal advice. As a co-worker in a good cause, as an earnest right-minded man, and as a conscientious public servant he won the high regard of his colleagues, and his memory will ever be cherished with honor and respect.

The following appointments were made among the members to represent the Board in the various counties, on the management of the County Temporary Homes for Indigent and Neglected Children :

For Hartford County,	Dr. Lindsley.
For New Haven County,	Prof. Brewer.
For New London County,	Dr. Wilson.
For Fairfield County,	Dr. Wordin.
For Windham County,	Dr. Wordin.
For Litchfield County,	Dr. Goodwin.
For Middlesex County,	Dr. Wilson.
For Tolland County,	Dr. Lindsley.

No other business offering the meeting adjourned.

Attest, C. A. LINDSLEY, *Secretary*.

SECRETARY'S REPORT.

Since the last meeting the Secretary has been called upon to visit different parts of the State on various matters related to the public health.

On the 14th of February, in response to a request of the Mayor of South Norwalk, he visited that place to confer with a committee of the Common Council and the City Engineer, in regard to the sanitary effect of a proposed outlet of a new line of sewers.

Having visited the locality with the party and heard the facts, he subsequently sent a written report, on the subject to the authorities at South Norwalk.

On the 7th of March he visited upon request of the County Commissioners, the Toland County Temporary Home to advise regarding the restriction of an epidemic of scarlet fever which was then in progress. He gave personal directions to the matron and others in charge of the Home and upon returning embodied them in a written report to the Commissioners.

Having been informed that the Health Department of New York City had erected a disinfection station for public use, where movable articles of clothing or furniture infected with the germs of contagious diseases could be purified, the Secretary in company with Dr. DeForest, a member of the New Haven Board of Health, visited New York to inspect it. The prominent purpose of the visit was to learn if it be practicable to provide such stations for the cities and larger towns of Connecticut.

The station was not in operation at the time of our visit. This however was rather an advantage than not, because it gave us better opportunity to inspect more in detail the internal construction of the apparatus than if it had been heated up. The design of the apparatus is to disinfect by means of steam and hot air under pressure ; and also by the generation of the fumes of burning sulphur in a closed chamber.

We were much disappointed to learn from the health officials that the processes were still in the experimental stage. That almost all the constructive apparatus employed consisted of the attempt to utilize material previously employed for other purposes, by adapting it to the uses now undertaken. Indeed scarcely anything employed at the station was originally intended for the purpose for which it was now used. Therefore if the methods proposed should prove effective and satisfactory, which is yet a matter of trial, the present appliance would afford little

information of the cost of a new plant specially designed for the purpose. After some farther trial of these processes we were informed a full report of the results would be published. The station is adjoining the Willard Parker Hospital, which is devoted exclusively to contagious diseases, 16th st., between Avenue C and the river.

The Secretary also visited the office of registration of vital statistics which is under the direction and superintendence of the Health department. Through the courtesy of Dr. Tracy he was shown much of the methods in practice, and gained many valuable hints, which would be of practical value if the vital statistics of the State could all be utilized by an expert.

Dr. Todd, Health Officer of Ridgefield, wrote the Secretary sometime in February requesting him to visit Ridgefield at his convenience after the snow was gone. He desired information as to his duties and powers as a Health Officer and also wished the opinion and advice of the Secretary in regard to certain special localities in the town and also as to the best disposal of sewage, when as in the case of Ridgefield there are no public sewers and no general water supply.

The Secretary visited Ridgefield on the 31st of March. He spent several hours with Dr. Todd going about to various parts of the town where sanitary conditions were questionable, and subsequently met at the Town Clerk's office the members of the Town Board of Health and had an interesting interview with them.

The town is so sparsely settled, and its inhabitants are scattered over so wide a territory that a general public water supply and a system of sewers adequate to the wants of all is economically impossible.

In a few places the Waring system of sub-surface irrigation is in use. In one case owing to defective engineering, or as was alleged the nearness of hardpan to the surface it proved unsatisfactory and has been abandoned.

The great majority depend upon that relic of barbarism, a cesspool. The privies are, however, many of them, an improvement on the underground vault; being managed on surface of the ground and upon the dry earth plan.

The prosperity of Ridgefield is largely dependent upon its reputation as a summer health resort, and the permanent residents and property owners in the town realize the importance of main-

taining a high standard of sanitary conditions. The local Health Board is watchful of whatever may be a source of danger to public health, and desirous of doing whatever may be reasonably practicable to protect and improve it.

The Secretary recommended, in the absence of a sufficient water supply and of public sewers, the extended application of the principle of disposal of sewage by land irrigation. The large areas of ground about the majority of the houses of Ridgefield, afford the most favorable opportunity for its employment. The success and satisfaction which has attended it in other places, justifies the belief that the methods based upon this principle, when skillfully and scientifically carried out, are the best yet devised.

The Secretary would report among the unusual occurrences of the month a death from hydrophobia in Hartford. The particulars have been published in the daily papers. He would also report a case of small-pox in Greenwich, imported from Texas, by a returned soldier. It was first communicated to children in the form of varioloid and not recognized but called chicken-pox. From exposure to these cases their grandfather took small-pox. His attack was at first mistaken for measles, and not until the diagnosis of small-pox was verified by its progress, did it occur to any one that the children had been the victims of varioloid instead of chicken-pox. When the true state of things became known however the local authorities proceeded promptly to enforce a general vaccination and take such other precautions that no other cases followed.

MINUTES OF SPECIAL MEETING OF THE BOARD AT SOUTH MANCHESTER.

A special meeting of the Connecticut State Board of Health was held in South Manchester on the 26th of June, 1891, by request of certain prominent citizens of that place, who desired the advice and judgment of the Board in regard to the disposal of the sewage of the village.

The Board after due notice convened about noon, with the arrival of the train from Hartford, and proceeded under the escort of Col. Frank Cheeney to his house where the members were hospitably entertained; after which adjourning to the library the engineers displayed their maps and drawings and explained in

detail the plans of the proposed method of disposing of the sewage upon irrigation fields, by land filtration.

The Board was then conveyed in carriages to the grounds upon which it was proposed to be delivered. After a careful inspection of the locations chosen with reference to surrounding conditions and the quality of the soil, the Board held a further consultation with the engineers. It was found upon conference that there was entire unanimity of opinion on the subject and the Secretary was directed to express it in a written report to be sent to the persons who had requested it.

No further business offering the meeting adjourned.

Attest, C. A. LINDSLEY, *Secretary.*

NEW HAVEN, CONN., July 8, 1891.

The regular quarterly meeting was held this day at the State House in Hartford.

The meeting was called to order by the President, Hon. A. E. Burr, at 2.30 P. M.

There were present Prof. Wm. H. Brewer and Drs. G. H. Wilson, R. S. Goodyear and C. A. Lindsley, and later Dr. N. E. Wordin.

The minutes of the last quarterly meeting were read and accepted. The minutes of the special meeting at Manchester were read, amended, and approved. The report of the Treasurer was read, accepted and ordered on file.

Communications from several parties were read and duly considered.

The report of the Secretary was made and accepted. The following officers were elected for the ensuing year:

For President—Hon. A. E. Burr.

For Treasurer—Dr. C. A. Lindsley.

For Auditors—A. E. Burr and W. H. Brewer.

No other business offering, the meeting adjourned.

Attest: C. A. LINDSLEY, *Secretary.*

NEW HAVEN, CONN., Aug. 4, 1891.

A special meeting was held this day at New Haven after legal warning, to consider and act upon a report to be submitted by certain members of the Board in regard to the condition of Byram River in Greenwich.

The meeting was convened at the office of the Secretary, and called to order by the President, Mr. Burr, at 1.30 P. M.

There were present Prof. Brewer, Dr. Wilson, Dr. Wordin, and Dr. Lindsley.

The Secretary stated the object of the meeting, and that three members of the Board, namely, Prof. Brewer, Dr. Wordin and himself had upon the request of the health authorities of Greenwich visited that town, and been taken to see the condition of the river, and the sources and character of the nuisances complained of.

After full consideration of the subject, and in response to a request from the Board of Health of Greenwich, that the State Board would send them a written report, the Secretary was instructed to send the following :

To the Board of Health of the Town of Greenwich:

At a special meeting of the State Board of Health, legally called this day at New Haven, to hear and act upon a report made by several of its members respecting the sanitary condition of Byram River and vicinity in Glenville and Pemberwick; the following action was taken :

Resolved, That the Secretary be instructed to report to the local Board of Greenwich that it is the opinion of the State Board that the waters of Byram River are polluted to that degree, by the refuse received from the woolen mill at Glenville, that the health of operatives in the bolt mill at Pemberwick is, in consequence of such pollution, unquestionably impaired.

Resolved, That the atmosphere in the bolt mills is so highly charged with the effluvia from the impurities in the river, that the good health of any person will be endangered by a continuous exposure to them during working hours.

Resolved, That it is the opinion of the State Board that its powers do not justify it in directing how the aforesaid nuisance shall be abated, that the duty of the State Board is limited to advising the local Board that a nuisance dangerous to public health exists in your town, and that the authority to abate does not reside in the State Board of Health.

No further business being presented, the Board adjourned *sine die.*

C. A. LINDSLEY, *Secretary.*

NEW HAVEN, CONN., Aug. 14, 1891.

A special meeting of the State Board of Health was held this day at Meriden.

The meeting was called at 1.45 at the Winthrop House to confer with the Committee on Sewers, appointed by the city to report on the disposal of sewage.

Mr. McKenzie, C. E., submitted to inspection and explained to the Board the course and direction of the trunk sewer, intended to conduct the sewage of Meriden about three miles from the center of the city to certain level fields near Hanover. At this place the sewage is to be discharged upon the surface by the method known as "broad irrigation."

After hearing a description of the plans, the Board was taken in a carriage with the engineer and the committee over the proposed line of the trunk sewer, to the irrigation fields. The field was a level plane with a very gentle descent towards the Quinnipiac river, upon which it bordered. Excavations had been made in several places to show the character of the soil. A few inches of surface was a light loam, beneath which, four feet and more, it consisted of strata of gravel and sand of varying degrees of fineness. It was the unanimous opinion of the Board that the porous nature of the soil was such that without any expense for underdrainage, it would be competent to receive the sewage without producing any effects detrimental to the public welfare.

The Secretary was informally directed to communicate in writing to the Committee on Sewers of Meriden, the approval of the State Board of Health of the plan proposed.

Adjourned.

C. A. Lindsley, *Secretary.*

New Haven, Conn., Aug. 27, 1891.

SPECIAL MEETING AT WATERBURY.

At the request of Nath. R. Bronson, Esq., the State Board held a special meeting in Waterbury this day at the Scoville House. No formal sitting was held, but the members present, to wit, Drs. Wilson, Goodwin, Wordin, and Lindsley, were taken in carriages to observe the condition of the Naugatuck River, at different points below the city, as to the effect of the presence of the Waterbury sewage in it.

The first observation was made at the rear of the premises of Mr. John A. Osborn, about two miles below Waterbury. From the bank of the river, with a long-handled dipper, he brought up from the bottom a dipper full of the sediment. It was of a semifluid consistence, very dark in color—not of homogeneous matter, and exceedingly offensive to the smell. Offensive gases bubbled up from the surface of the water over where it was taken.

The second stop was above the dam at Platt's Mills. Here near the bank was floating upon the surface a collection of most offensive material some 10 by 20 feet in extent, by guess, and upon disturbing it with a long pole there was emitted a most disgusting stench. Other floating matters of similar character in appearance were within view. Upon disturbing the bottom of the pond at this place with a pole bubbles of gases were immediately produced.

At still another place near the mills by the roadside the water appeared very dirty and immense bubbles of gas were disengaged upon stirring up the bottom.

At another place some distance below, above the bridge at Naugatuck, the bed of the river was scarcely covered with water, the body of the stream having been intercepted by dams and diverted to the water wheels of the mills. The bottom of the river being thus uncovered and exposed was said to have given off very strong odors, making it necessary for the neighboring residents to close their windows.

After these inspections the members of the Board held a brief informal meeting at the town hall, Naugatuck, at which time it was agreed, that a report of these inspections should be made to the Board at an early meeting.

The members then dispersed to their several homes.

Attest: C. A. Lindsley, *Secretary*.

Hartford, Conn., October 10, 1891.

The regular quarterly meeting was held this day at the Capitol, after legal warning.

The meeting was called to order at 2.30 P. M. by the Secretary. The President being absent Dr. Wilson was chosen chairman *pro tempore*.

The minutes of the last quarterly meeting were read and approved. Also the minutes of special meetings held August 4th at New Haven, August 14th at Meriden, and August 27th at Waterbury, and were each in turn approved.

On motion of Prof. Brewer it was

Voted, that the Secretary be instructed to express in a written report to the Board of Health of Waterbury the opinion of the State Board of Health in regard to the pollution of the Naugatuck river.

On motion of the Secretary it was

Voted, that Prof. Brewer be associated with him in the preparation of the report.

The report of the Treasurer for the quarter was read and accepted.

President Burr having arrived assumed the chair. The other members present were Prof. Brewer, Dr. Goodwin, Dr. Wordin, and Dr. Lindsley.

A communication to the Secretary from Prof. J. J. McCook was read, asking an opinion in regard to legislation concerning the discharge of inmates of jails, almshouses, etc., while suffering from contagious diseases.

The consideration and discussion of the subject resulted in the passage of the following votes offered by Prof. Brewer.

Voted, that it is the sense of this Board that legislation is desirable regarding the discharge of persons from public institutions while suffering from contagious or infectious diseases.

Voted, that the Secretary be authorized in behalf of the Board to promote the passage of such legal restrictions relating to the control of such patients as he may deem expedient.

A communication to the Secretary from the Hon. Robert P. Porter, Supt. of Census, was read relating to a resolution passed by the United States Senate, Feb. 16, 1891, respecting the establishment of a permanent census bureau.

The subject was respectfully and attentively considered, but no formal action was taken beyond a general expression of approval of the proposition.

No other business offering, the meeting adjourned *sine die*.

C. A. Lindsley, *Secretary*.

Approved.

Secretary's Report.

QUARTERLY MEETING.

October 10, 1891.

The health of the State has been maintained at about its usual standard for the season. The quarter ending Oct. 1st is always one of greatest mortality. The excess over other quarters being due to the greater prevalence of intestinal diseases, especially among children, during the hot season.

The only instance since the State Board of Health has had charge of the registration of vital statistics, when the mortality

of the third quarter of the year was not the largest, was last year, 1890. The general epidemic of influenza at the beginning of the year was so fatal in its effects, direct and indirect, that the deaths considerably exceeded those of any other quarter.

A notable fact relating to the causes of death is the increased mortality from typhoid fever during the last two months of the quarter. The deaths reported were as follows: in July, 9; August, 42; September, 41. This, however, does not compare very unfavorably with the same months of some previous years.

In the early part of September I was notified by Dr. Scott of Danbury that there were in that city eight or nine cases of typhoid fever; and that all the victims had been sojourning at the hotel on Money Island.

After getting the approval of the Comptroller to incur the necessary expense, I requested Prof. H. E. Smith to make an investigation of the outbreak.

His report is not yet ready, as he is still pursuing his enquiries. I can, however, say that the infection was far more active than at first supposed. He has already traced 18 cases among the temporary residents of the hotel between August 6th and 18th. All were there together between the 10th and 14th. Of these, eight or nine were in Danbury and the others in New Haven, Hartford, Brooklyn, N. Y., and Orange, N. J.

If the words of caution to the guests of summer resorts, published in the Bulletin of June, had been heeded, this widespread infection of typhoid would not have occurred.

Anticipating the report of Prof. Smith, I may say that the water supply of the hotel was the probable source of the infection.

While the total mortality throughout the State has not been greater than the usual summer rate, it is to be observed that there has been a very unequal distribution of the deaths. For instance, in the towns of over 5,000 inhabitants the annual death-rate in the month of July varied from 5 to 42 per 1,000. Waterbury suffered most during this month, the mortality being chiefly from intestinal disorders, and 74.3 per cent. of the total deaths were among children under 5 years of age. The annual death-rate for July in Waterbury was 42.2. And throughout the quarter the death-rate of that city was the highest, although some towns had a high death-rate in August.

For the first two months of the quarter the death-rate was a fraction over 20, for September the returns are not all in, but judging from those received, the rate will be less.

I have but little to report of the work of the Board during the quarter. The special meetings of the Board and the records thereof indicate pretty fully what beside the usual routine business has been done.

The requests for the aid and advice of the Board from the towns of Meriden, Greenwich, Waterbury and other places show how it has won the regard and confidence of the people of the State.

Not only that, but the enterprises undertaken by so many towns in the State within a very recent period, for the purpose of obtaing water supplies, providing for the proper disposal of sewage, and the abatement of nuisances prejudicial to health, are convincing proofs of the growing intelligence on matters relating to public hygiene.

THE HEALTH OF TOWNS.

HEALTH OF TOWNS.

The following statement in regard to the health of the towns of Connecticut is compiled as usual from the only reliable sources of information, the practicing physicians, residents in said towns.

This information is rendered upon request of the Secretary of the State Board in response to a circular of interrogatories which the secretary sent to one physician resident or practicing in each town in the State.

The State Board here desires to express its thanks to the correspondents who have so freely and gratuitously given these much desired facts.

This is the eighth series of reports relating to the health of the separate towns. It is to be regretted that all the towns are not represented by a respondent. However, those which have answered are so widely distributed throughout the whole State that a very satisfactory and full idea of the general health and the character of the prevailing diseases is afforded.

The following are the questions propounded to the sanitary correspondents. Abstracts from the replies to these form the substance of the report:

QUESTIONS RELATING TO THE TOWN OF ——

1. Diseases especially prevalent?
   a. Are the causes known and removable?
   b. Please state additional particulars of interest.
2. Does your Board of Health make Sanitary Inspections Systematically or does it act only upon complaints received?
3. Rare or Strange Diseases?
4. Has Typhoid Fever been unusually prevalent?
   a. In what months most prevalent?
   b. Has it been traced in any instance to a special source?
5. Is disinfection of Excreta of Typhoid patients insisted upon by the physicians in your vicinity?

6. Extent and prevailing type of Typhoid Fever?
   a. Are isolation and disinfection usually practiced with Scarlet Fever patients?

7. After death from contagious diseases what precautions are observed concerning Funerals, Disinfection, etc.

8. Extent and prevailing type of Measles?
   a. Restrictive precautions?

9. Diphtheria. Extent and type?
   a. Proportion of deaths?
   b. Are isolation and disinfection practiced?
   c. Can you give any facts relating to its beginning and mode of spreading?
   d. General sanitary condition of houses infected with Diphtheria?

10. Have Malarial Diseases prevailed more than in 1890 or less?
    a. If at all what is their general character?

11. What is the Water Supply of your town?
    a. Is it good in all months of the year?

12. Sewage Disposal?

13. What sanitary improvements have been made within the year?

14. What of the Drainage?

15. What is the general sanitary condition of town as regards Water Supply, Sewage Disposal and Drainage? Good? Bad? or Indifferent?

16. Has your Board of Health issued a code of Sanitary Regulations?

ABSTRACTS FROM THE REPORTS RECEIVED IN ANSWER TO THE ABOVE INQUIRIES.

These reports are arranged by counties, and the towns are in alphabetical order.

HARTFORD COUNTY.

Avon—R. W. E. Alcott, M.D., Reporter.

1. La Grippe during March, April and May.

b. Whole families taken down at once. Many cases developing into pneumonia of a catarrhal or broncho-pneumonia variety.

2. Acts only on complaints received.

4. No cases during the year.

5. Yes.

6. None.

a. Yes.

7. Preventives taken.
8. None.
9. None.
10. Less.
11. Wells and springs.
a. Yes.
12. Cesspools and surface drainage.
13. None.
14. Very good.
15. As good as most country towns.
16. No.

BERLIN—R. E. ENSIGN, M.D., Reporter.

1. Measles the most prevalent.
a. No.
2. Mostly on complaint received, for reasons given in the town report.
3. None.
4. No.
a. Perhaps two or three cases in September.
b. I don't think so.
5. It is.
6. Very little and that brought in by visitors, and no spread.
a. Yes.
7. Fumigation and burning matresses, etc. No public funeral permitted and body to be buried within twenty-four hours.
8. Somewhat prevalent in winter and rather severe.
a. Not any.
9. Very little. It appears somewhat difficult sometimes to diagnose it from follicular tonsilitis.
a. Not over five per cent.
b. Yes.
c. I can say no more than is found in the text books.
d. Equal I think to the average.
10. Much less.
a. Very obscure.
11. Wells and cisterns.
a. Yes.
12. Mostly on the ground, a few cesspools.
13. None, only about premises complained of.
14. Good.

15. Good. There is an increasing interest among the citizens relative to these things.

16. No, but it is the intention of the health officer to do so.

BRISTOL—H. E. WAY, M.D., Reporter.

1. Catarrhal inflammation of intestines and respiratory apparatus.

2. I think only upon complaints ; I am sure not systematically done.

4. No.

a. Only a few sporadic cases.

b. With no probability of certainty or even rationally. I get this from our physicians.

5. Yes. I think uniformly so now, so I am told by the physicians of the town.

6. Entirely exempt this year so far as I can learn.

a. Yes, by all of us.

7. Generally the precautions necessary in such cases, such as quick burial with painstaking disinfection.

8. None.

a. We regard your circular No. 44 here and elsewhere.

9. Two fatal cases. One other case in same family recovered.

b. Yes.

c. The first case in this family it was thought might be traced to the boys cleaning a very filthy hen house a few days before attack.

d. Good as appeared, these cases were in families of the wealthy.

10. Less I think, sure not more.

a. I have neither heard of or seen any cases. From laymen one would think there was no cause of illness except malaria. Not a bad dietary, not excesses, not debauchery which causes sickness ; no, but malaria the universal and efficient cause.

11. Reservoir. Not as good as one year ago. I think it has slowly deteriorated from the first, certainly so in taste and odor.

a. In quantity, not in quality.

12. Cesspools ; into streams ; upon surface.

13. None public. Individuals are doing quite well in this matter among the humble in life. Money will protect the rich.

14. Natural drainage fair, at least as I should think, though in some parts of town not good. Nothing artificial except in a

private manner. Dirtiness, darkness and dampness is somewhat appreciated as large factors of disease and death. Had we the mechanism to make men good we thus might be more healthy.

15. Water supply indifferent perhaps, except in quantity. Sewage bad, drainage artificial, also bad ; yet I believe the public health has been good.

EAST GRANBY—S. R. BURNAP, M.D., Reporter.

1. Measles and La Grippe.

2. Only upon complaints received.

3. La Grippe affected quite a number and caused the death of a few elderly people.

4. There have been no cases that I am aware of.

5. Yes.

6. None.

a. Yes.

7. Funerals private and disinfection practiced to some extent.

8. There were a few cases of measles of moderate severity, no fatality.

a. Restrictive precautions I think were not sufficiently observed.

9. None, so far as I know.

10. Scarcely any at all.

11. Mostly from deep wells.

a. Yes.

12. Such as is usual in farming districts.

13. None.

14. Mostly good.

15. Good water and drainage. Sewage disposal indifferent.

16. No.

P. S.—East Granby boasts a centennarian in the person of a Mrs. Gould, who passed her hundredth birthday a few months ago.

EAST WINDSOR—BROAD BROOK—H. O. ALLEN, M.D., Reporter.

1. None. The general health of the town has been better than for some years.

2. Our Health Board acts only upon complaints.

3. None to my knowledge.

4. No. There have been but few cases in town.

a. September and October.

b. No.

5. It is strongly recommended by the physicians and in many cases insisted upon.

6. Very little, if any.

a. So far as possible.

7. I am inclined to think that the public is more careless in this respect than it should be. As far as possible the attending physicians try to regulate this matter for the best interests of humanity.

8. None to my knowledge.

a. None.

9. A few mild cases.

a. I have heard of none.

b. Yes.

10. Less.

a. We have had so few cases that I could hardly say. I have not seen a case of regular intermittent fever since January, 1890.

11. Wells and springs.

a. Yes.

12. Top of the ground and carted away.

13. None in particular.

14. Good.

15. Good.

16. Yes. Issued two years ago. We have found no reason to change it as it covers most of the ground.

ENFIELD—R. STRICKLAND, M.D., Reporter.

1. Not any.

2. Only on complaints received.

3. Not any.

4. More than for four or five years.

a. September and October.

b. Bad wells.

5. Yes.

6. A few cases only, mild type.

a. Isolation generally, disinfection occasionally.

7. Disinfection occasionally. Generally a quiet funeral.

8. Only a few cases, mild type.

a. None.

9. A few cases, mild type.

c. No.

d. Generally good.

10. Less.

11. From springs and wells, with an excellent system of water works.

a. Yes.

12. Into the Connecticut River and cesspools. That from cesspools used as a fertilizer.

13. Not any.

14. Good.

15. Good.

16. I have not seen any.

FARMINGTON—FRANK WHEELER, M.D., Reporter.

1. None.

2. Acts only when called upon, but then promptly and efficiently.

4. No.

5. Yes.

6. Two cases in one family in February, and appeared next in July in three adjacent families.

a. Yes; not generally severe.

7. Yes.

8. None.

9. None.

10. Less.

11. General supply from reservoir, and from wells and springs for household use.

a. Yes.

12. By cesspools and drains.

13. Very few.

14. Generally surface drainage.

15. Water supply good, sewage disposal bad, drainage indifferent.

GLASTONBURY—JULIUS EGBERT GRISWOLD, M.D., Reporter.

1. Malarial, with typhoid symptoms in more cases than usual the past fifteen years.

a. Not that I can see.

2. Only upon complaints received.

3. None that I know of, don't think there has been any.

4. The cases of so-called typhoid that I have seen are mixed with malarial troubles.

a. None particularly.

b. No.

5. Yes, so far as I know.

6. Have known of no cases.

a. Yes.

7. No public funerals. Disinfection practiced.

8. Have not known of but few cases, mostly mild.

a. Isolation.

9. Less than years before, mostly mild.

a. Small.

b. Yes.

c. Springs up here and there. Sometimes it can be traced, more times not.

d. Usually as good as can be under existirg conditions.

10. Rather more, I should say.

a. Every form one can imagine. I think affects the nervous system generally rather more.

11. Wells mostly, springs and brooks in a few places.

a. Yes.

12. Top of ground.

13. None.

14. Same as country towns, top of ground mostly.

15. Good.

16. Yes.

GRANBY—WALTER G. MURPHY, M.D., Reporter.

1. During the winter months pneumonia.

2. Relies more upon complaints received. Acts where sanitary conditions need it, but not systematically.

4. No. Very rare this year.

5. Yes.

6. No epidemic has been noticed.

a. Yes.

7. All required by law.

8. During March and April a few cases. Did not spread.

9. No cases of diphtheria.

10. Less.

11. From wells and springs.

a. Yes, some of the wells have been dry this late dry spell.

15. Good.

16. No.

HARTFORD—JAMES CAMPBELL, M.D., Reporter.

1. Pneumonia from January to April and some cases of influenza. Diarrhœal diseases in the summer months and typhoid and typho-malarial fever during the autumn, with cases of diphtheria occurring now and then throughout the year. Usual amount of phthisis.

a. Sometimes.

2. We make general inspection and act on all complaints as well, though our force is not sufficient to thoroughly and systematically inspect each house at regular intervals.

3. Somewhat rare, perhaps was the appearance in October of quite a number of cases of cholera infantum, if not rare, unusual.

4. Yes.

a. From August to December inclusive.

5. Yes.

6. Less than usual.

a. Yes.

7. Burial as soon as practicable. Disinfection of room and effects of patient. Clothing used during the disease disinfected, sometimes destroyed by fire.

8. Light.

9. Severe in type.

b. Yes.

c. In some cases the disease seems easily traced, in others extremely difficult or impossible.

d. Largely the less sanitary, though the most carefully regulated houses have suffered.

10. Less I should say.

a. Sub-acute.

11. Stored in reservoirs.

a. Yes, when sufficient in amount.

b. Connecticut River.

15. Water supply good ; sewage disposal good ; system of sewers faulty in some places.

16. Yes.

MANCHESTER (SOUTH MANCHESTER)—JULIAN N. PARKER, M.D., Reporter.

1. Remittent fever.
a. Doubtful.
2. On complaints received.
3. Not any to my knowledge.
4. About an average for the past six or eight years.
a. September and October.
b. I doubt if there has been an instance where it could be traced to a special source.
5. Not always.
6. Few mild cases.
a. Usually when known.
7. Private funerals is about all.
8. Few mild cases.
a. Kept at home.
9. Do not know of any cases.
a. Do not know of any deaths.
b. Yes.
c. No.
10. I should say less.
a. Mild remittent, intermittent and typho-malarial fevers.
11. Mostly hydrant water, some cisterns and some wells.
a. First-class.
12. Partly through pipes under ground and partly vaults.
13. A good many houses and buildings have been connected with the sewer.
14. Mostly surface.
15. Good.
16. Not to my knowledge.

NEW BRITAIN—G. J. HOLMES, M.D., Reporter.

1. Typhoid fever, German Measles, Scarlet fever, Diphtheria, Rheumatism and La Grippe.
a. No.
b. There is no malaria present. Typhoid fever and malaria do not appear at the same time.
2. Only upon complaints received of unsanitary conditions existing. There is no inspection except in response to complaints.
3. None except the "grippe."

4. Yes.

a. September and October.

b. Not to my knowledge. There are families which have all been afflicted with this disease. These were mostly in low wooden tenement houses.

5. Yes, quite generally but not entirely.

6. Less than the ordinary number of cases, mostly mild.

a. Yes, but not in a satisfactory way, especially among the poor and in large families.

7. All whose deaths result from contagious diseases are supposed to be buried quietly and without public funeral.

8. The German measles have been most prevalent, but no malignant cases have been reported to my knowledge.

a. No other precautions are taken except the patient, if a child, is kept from school and isolated as much as possible.

9. More than the average number of cases, mostly mild, some malignant.

a. About one-third.

b. Yes.

c. Mostly from sink drains and damp places, such as low cupboards.

d. No house seems to be exempt, but the malignant variety has appeared in low filthy places.

10. Malarial diseases have not appeared at all this past year, and the physicians in this locality have long noticed this peculiarity, that malaria and typhoid fever are never at the same time present.

11. Shuttle Meadow.

a. Yes. At times a little fishy from fresh-water algæ, but tends later to purify itself.

12. Into the Connecticut River through smaller streams.

13. New sewers and connections therewith, so decreasing the cesspools.

14. Drainage is perfect. The city is on high ground. The roof of one of the churches forms a water-shed, one side shedding to the north and the other to the south.

15. Good.

16. No. We have and are guided by a city ordinance.

NEWINGTON—LOUIS V. DURAND, M.D., Reporter.

1. La Grippe.
a. No.
2. If we have reasons to suspect non-sanitary conditions we make inspections.
4. But two cases, mild type.
a. June.
b. No.
5. Yes.
6. None.
a. Yes.
7. Since the organization of our Board of Health we have had no deaths from contagious diseases. Should such occur we will resort to such measures as are recommended by sanitary authorities.
8. A few cases of a mild type.
a. None, as most cases were under domestic treatment.
9. Two cases mild type.
a. No deaths.
c. No.
10. Less.
11. Reservoirs, wells, springs.
a. Yes.
12. Outhouses, cesspools, dry closets.
13. None.
14. Good.
15. Indifferent.
16. Not as yet, but it is agreed on to do so without delay.

PLAINVILLE—J. N. BULL, M.D., Reporter.

1. Inflammation of respiratory tract.
a. No.
2. Only upon complaints received.
4. Not a case.
5. Yes.
6. No cases during past year.
a. By myself it would be as far as possible.
7. I believe proper persons are given instructions in these matters.
8. Some cases of medium severity.
a. Not thorough.

9. A number of mild cases, a few of medium severity.
a. None.
b. Yes.
c. No.
d. All conditions.
10. I have seen more cases.
a. All forms, but many cases of continued type, running to average about three weeks.
11. Reservoirs and wells.
a. Yes, excepting reservoir in July and August the water is not clear and is muddy in taste.
12. No cisterns.
13. Several sewers have been built.
14. Bad.
15. Indifferent.
16. No.

ROCKY HILL—RUFUS W. GRISWOLD, M.D., Reporter.

1. Not any.
2. The latter.
4. No, scarcely any.
b. No.
6. Not any.
a. Haven't had the cases.
8. Not any.
9. Haven't heard of any.
a. No deaths.
10. Rather less.
a. No specific general character, irregular in symptoms.
11. Wells.
a. Yes.
12. Drained or thrown on the surface.
13. None.
14. First-class; natural, into the brooks and the Connecticut River.
15. Good.
16. No.

SOUTHINGTON—W. G. STEADMAN, M.D., Reporter.

1. None. *Very healthy.*
2. Upon complaints.

3. Have heard of none.

4. No.

5. Not by all.

6. None.

a. To some extent.

7. Not always observed. Undertaker generally uses disinfectants, and sometimes hastens funeral ceremonies which are attended only by nearest relatives.

8. Very few cases and mild in character.

a. None.

9. Very little, mild.

a. None.

b. Yes.

c. No.

d. Can say nothing definite of them.

10. Less.

a. Have hardly seen any.

11. From a brook on mountain three or four miles from town.

a. Yes.

12. Cesspools.

13. None.

14. Indifferent.

15. Good, bad and indifferent respectively.

16. No.

SOUTH WINDSOR—CHAS. L. BLAKESLEE, M.D., Reporter.

1. Chronic malarial infection.

a. Are known but not removable.

2. No, acts on complaints received.

3. None except one case of ostio-myelitis of tibia, with measles as exciting cause.

4. No, but two cases.

b. No.

5. Yes.

6. Not extensive, have myself had none.

a. Yes.

7. Thorough fumigation of house with burning of everything pertaining to bedding and clothing of patients. Funerals are of the simplest form possible.

8. Has been mild but quite extensive. No deaths have occurred.

a. Isolation.

9. Five cases, four malignant and four died.

a. Eighty per cent.

b. Yes.

c. All in one family, the father the only one who lived contracted it in a tenement house in the city of Hartford.

d. Very bad.

10. About the same.

a. Chronic malarial generally, with an occasional case of the intermittent type of chills and fever.

11. From wells mostly, some houses being supplied from springs.

a. Usually.

12. Cesspools and compost heaps.

13. None.

14. Is by ditches and natural streams.

15. Good.

16. Not to my knowledge.

SUFFIELD—J. K. MASON, M.D., Reporter.

1. None, unless I except a second mild visitation, a sort of pocket edition of La Grippe last spring.

2. Mostly upon complaints received.

3. A case of biliary calculi discharged through an external abscess.

4. None, though I noticed that somebody had reported a case to the Town Registrar which appeared in the monthly health bulletin last spring.

5. I think so, at least much more than formerly.

6. None.

a. Yes.

7. No such funerals the past year. In case of their occurrence isolation and disinfection would be promptly and rigidly enforced.

8. Only a few cases, mild.

a. Most people say, "better to have them in childhood and done with it."

9. Have heard of only one or two mild cases.

a. No deaths.

b. Yes.

10. Less.

a. Mildly complicatory.

11. Wells, springs and cisterns.

a. Yes, except in droughts, when now and then a well gives out.

12. Mostly cesspools.

13. Removal of one slaughter house and abatement of several nuisances.

14. No system.

15. Good.

16. No.

WETHERSFIELD—EDWARD G. FOX, M.D., Reporter.

1. Influenza during the spring months.

2. Acts upon complaint.

4. No.

a. August and September a few cases.

b. No.

5. Yes.

6. None.

a. Yes.

7. Funerals strictly private and thorough disinfection employed.

8. March and April, limited to one section of the town (one school district); yielded to treatment readily.

9. None.

b. Yes.

10. Less. Very rare to find a case during the past year.

a. Of the intermittent type when we have a case.

11. Wells. The northern portion of the town supplied by Hartford water works (reservoir).

a. Yes.

12. None.

13. None.

14. None. Surface drainage generally.

15. Water supply good.

16. No. The general health of the town during the past year has been unusually good.

WINDSOR—NEWTON S. BELL, M.D., Reporter.

1. No special disease.
2. Only upon complaints received.
3. There have been none out of the ordinary course.
4. No.
a. September and October.
b. Yes, in almost every case either to bad drainage or bad drinking water.
5. It is.
6. But few cases and of a mild type.
a. Always as far as is possible.
7. The usual disinfectants are used.
8. Have not known of a case.
9. A few cases of diphtheritic throat.
a. No deaths.
b. Yes.
10. About the same.
a. They have occurred mostly as complications of other diseases.
11. The village supplied by pure spring water, the rest of the town by wells.
a. Yes.
12. Not what it ought to be.
13. Very little, if any.
14. The town, as in former years, surface drainage; the village, by sewers.
15. Fairly good.
16. No.

WINDSOR LOCKS—S. R. BURNAP, M.D., Reporter.

1. No form of disease has been especially prevalent during the past year.
2. Only upon complaints received.
4. No, I have heard of but two cases.
a. The two cases referred to exist at the present time, November.
b. No.
5. No.
6. None.
a. Yes.

7. Funerals in most such cases are private, and all necessary precautions are observed.

8. There were only a few cases, mostly of mild form.

a. Isolation and disinfection were practiced.

9. There has been none that I have heard of.

10. Malaria is very rarely met with in this town.

11. The town is supplied with water of excellent quality by the Windsor Locks Water Company.

a. First-rate.

12. Not so good as it should be.

13. None.

14. In some cases very good, others indifferent.

15. Water supply excellent, sewage disposal bad, drainage indifferent.

16. No.

NEW HAVEN COUNTY.

Beacon Falls—F. B. Tuttle, M.D., Reporter.

1. None.

2. Only on complaints.

4. No.

a. None.

b. No.

5. Yes.

6. A few cases.

a. Yes.

7. Disinfection.

8. I think none.

a. No.

9. A few mild cases.

a. None.

b. Yes.

c. No.

d. Bad.

10. I think less.

a. Remitting.

11. Wells.

a. No.

12. Cesspools and top of ground.
13. None.
14. Bad.
15. Indifferent.
16. I do not know.

BRANFORD—C. W. GAYLORD, M.D., Reporter.

1. Influenza latter part of winter and early spring, and scarlet fever.

2. On complaints received mainly, but many nuisances abated per order of Health Officer without formal complaint.

3. Purpura hemorrhagica.

4. No.

a. September and October.

b. No.

5. Personally yes, and I think generally.

6. Has been prevalent from early spring to present time, cases mostly mild.

a. By order Board of Health, but practically no. Children kept from school for fear of contracting it, but allowed to play in streets with children who have been confined in house two or three days only.

7. Private and immediate burial and thorough disinfection of house, etc. Orders *occasionally* strictly followed.

8. None.

9. A few cases, no epidemic. A few deaths from diphtheritic croup and membranous croup.

a. Small, unless membranous croup be included.

b. Yes.

c. No, unless in one family of six, all taken within three weeks. Undoubtedly due to unsanitary conditions about residence, foul cesspool, etc.

d. *Poor*, I think without exception.

10. About the same, less if anything.

a. Cases of marked and typical intermittent fever quite common, also malarial neuralgia.

11. Wells and cisterns mainly.

a. Fair of its kind.

12. By cesspools and surface drainage, some carried in buckets to a distance and disposed of by spreading on soil.

13. Attempts made to secure improved drainage in several sections about the village.

14. In the main that supplied by nature only, and that in some cases has been obstructed.

15. Indifferent, much improved water supply and sewage disposal.

16. Yes.

CHESHIRE—M. N. CHAMBERLIN, M.D., Reporter.

1. Measles latter part of the winter, spring and until first week in July.

2. Makes inspections when considered necessary, also acts on complaint.

3. None.

4. A little more than last year.

a. Fall.

b. Some reason to think that one case which returned sick from a neighboring city was due to defective condition of sewer pipes.

5. I think it is generally practiced.

6. One case only, imported from Wallingford, recovery.

a. To some extent.

7. In some cases proper precautions are observed.

8. Widespread epidemic in the spring as above, no deaths.

a. Not any.

9. About twenty cases.

a. Two I think.

b. Yes.

c. No.

d. Good, as far as could be ascertained. In one house were several cases in succession, careful and thorough examination failed to detect any local cause. No more cases after thorough fumigation with sulphur.

10. A little less, if any difference.

a. Mild.

11. Generally wells, a few springs.

a. Yes, except when very dry. Now, (November, 1891) a number of wells are dry.

12. Generally surface, some cesspools.

13. Cesspool at Congregational parsonage abolished. Reason to believe it had contaminated the well water. Channel of old canal cleared out.

14. Generally good.
15. Good.
16. No.

DERBY—CHAS. H. PINNEY, M.D., Reporter.

1. None.
2. Only upon complaint.
4. Yes.
a. From March till November.
b. No.
5. Very seldom.
6. Very little, very mild.
a. No.
7. Very few.
8. None.
a. None.
9. Very little ; none.
b. No.
c. No.
d. As often in the most perfect as in those where it is very bad.
10. About the same.
a. Mild.
11. Very largely from public lakes.
a. Yes, very.
12. Naugatuck River.
13. None to my knowledge.
14. Very good indeed.
15. Good.
16. No.

EAST HAVEN—WALTER H. ZINK, M.D., Reporter.

1. None to any extent. This town is very healthy and free from all serious diseases.
2. Only on complaints.
3. None.
4. None.
5. Yes.
6. The few cases in this vicinity have been very mild cases of scarlatina without angina.

7. Disinfection of everything used by and about the patient, and burial at once if death was due to them.

8. None since last report.

9. None.

10. Less.

a. Mild.

11. Wells.

a. Very good.

12. Natural drainage, owing to the town being elevated. The sewage is used as fertilizer.

13. None.

14. Natural.

15. Very good.

16. No.

GUILFORD—G. P. REYNOLDS, M.D., Reporter.

1. Influenza and malarial diseases.

2. I cannot say.

3. None.

4. No.

5. Yes.

6. If any the past year it was the simple type.

a. Yes.

8. Very few cases.

9. Mild type of same, few cases.

a. No deaths.

b. Yes.

d. Bad.

10. More.

a. Remittent.

11. From wells and cisterns.

a. Very good.

12. Bad.

13. None to my knowledge.

14. Poor.

15. Water supply very good, the two latter bad.

16. I do not know of any code issued.

HAMDEN—EDWIN D. SWIFT, M.D., Reporter.

1. None.

2. Only after authentic information.

4. No.

5. I believe it is.

6. Severe.

a. Yes.

7. Private burials and thorough disinfection of houses, furniture, beds, bedding, and all wearing apparel.

8. No measles.

9. Malignant, confined to one family.

a. One hundred per cent.

b. Yes.

c. The first child died unattended by a physician, and the second contracted it from the first.

d. Good, so far as can be known.

10. More.

a. Fevers of longer or shorter duration.

11. Wells and springs.

a. Yes.

12. Privies, blind and open cesspools.

13. I do not recall any of special interest.

14. No change.

15. Good.

16. No.

MADISON—DANIEL M. WEBB, M.D., Reporter.

1. Bronchial troubles, tonsilitis and pharyngitis.

a. No.

b. Bronchial troubles resemble in many of their features La Grippe.

2. Only on complaints received and then slowly. No physician here is connected with board of health.

4. No typhoid to my knowledge.

5. Yes, by me.

6. No scarlet fever.

a. Always by me.

7. All proper precautions are advised by me.

8. No measles.

9. No diphtheria to my knowledge.

10. Less.

a. General character not pronounced but masked.

11. From wells.

a. Fair, except when wells are low, which has been the case of late.

12. Indifferent.
13. None whatever.
14. Same as usual, rather below par.
15. Indifferent.
16. Not to my knowledge.

MERIDEN—G. H. WILSON, M.D., Reporter.

1. Common kinds, no epidemic.
2. Only on complaint and then seldom.
4. No, strictly speaking very little.
a. Autumn.
b. No.
6. Mild.
a. Generally so.
7. The rules of the town Board of Health are good.
8. Scarcely any.
9. Moderate in extent and mild.
a. Low.
b. Yes.
c. Not epidemic and has seldom spread during the year.
d. Fair.
10. A little more.
a. Indefinite, almost no regular paroxysms.
11. Reservoir and supplied by hydrostatic pressure. Expect to add a pumping supply.
a. Yes.
12. Not systematic, half cesspools and half into streams.
13. A system of sewerage has been adopted by vote.
15. Good.
16. Yes.

MIDDLEBURY—MARCUS DEFOREST, M.D., Reporter.

1. There are none.
2. Only upon complaints. Middlebury is a very healthy town.
3. None.
4. Has not. Only one or two cases in the year, hardly typical.
a. September.
b. No.
5. Yes.
6. No cases.
a. Yes.

7. Reasonably private funeral and thorough disinfection.

8. No cases recently.

a. For children the practice is to allow it to run through the family and neighborhood and with proper care do its own vaccination.

9. No cases.

10. Malaria troubles us but little.

11. Wells mainly.

a. Generally. We are so high the supply has been a good deal restricted the past two or three months and many wells are now dry.

12. We have now so-called sewers. From most dwellings drainage is fairly good.

13. None.

14. As above.

15. Good.

16. No. I have observed that fire engines are obtained after the town is burned. The stable door is locked after the horse has been stolen. The bridge is rebuilt after the train with its human freight has gone through, and men without an enemy in sight rarely waste their bullets or project proclamations or codes against them. To be plain we have, under the conditions, been hardly able to maintain life sufficient for our annual organization and appointment of officers.

MILFORD—E. B. HEADY, M.D., Reporter.

1. Pneumonia, bronchitis, dysentery and summer complaints.

2. Only upon complaints received.

3. None.

4. Less prevalent.

a. September and October.

b. No.

5. Yes.

6. None.

a. Yes.

7. No precautions taken.

8. None.

9. Less than usual; malignant.

b. Yes.

c. The malignant cases observed came from other localities where it prevailed.

d. Good.
10. Less.
a. Chills and fever.
11. Wells.
a. Good generally.
12. Cesspools and surface drainage.
13. None.
14. No drainage.
15. Indifferent.
16. No.

NAUGATUCK—F. B. TUTTLE, M.D., Reporter.

1. None.
2. Only on complaints.
4. No.
a. October and November.
b. No.
5. Yes.
6. Number of cases, mostly mild.
a. Yes.
7. None concerning funerals ; disinfection of house after death.
8. A large number of cases, mild.
a. None.
9. Many cases, mostly mild.
a. Three.
b. Yes.
c. No.
d. Bad.
10. I think more.
a. General character of a remitting type.
11. Public water supply from reservoir.
a. Yes.
12. Cesspools, top of ground and into Naugatuck River.
13. None.
14. No general system.
15. Water supply good, sewerage and drainage bad.
16. Yes.

NEW HAVEN—GUSTAVUS ELIOT, A.M., M.D., Reporter.

1. The total mortality for the year ending October 31, 1891, was 1,594. This is less, by 115, than the mortality for the pre-

ceding year, but greater, by 107, than that for the year ending October 31, 1889. Epidemic influenza was moderately prevalent during the spring of 1891, but was much less common and much less severe than during the month of January, 1890. With this exception the usual diseases have prevailed to about the usual extent, and with about the usual severity. There has been, perhaps, a rather greater mortality than common among puerperal women, although the official statistics do not make this very evident.

a. It is now generally recognized that a great deal of sickness is dependent upon individual carelessness of various kinds. Sometimes it is due to the disregard of the precautions which experience has shown should be observed if the preservation of health is desired, or to the indiscretions of the individual who is sick. Not infrequently it is directly traceable to gross negligence of others than the sufferer. It is, we fear, occasionally, we hope very rarely, due to the inadvertence of the physician, who may have carried some contagious disease from one person to another, or may have failed to seize a favorable opportunity for interrupting the course of a disease, which is hurrying its victim to death. Causes of this kind are clearly to a considerable extent removable, if individuals will pay greater attention to personal hygiene, and if municipalities will follow more closely the plain teachings of sanitary science.

b. It is of some interest to local students of vital statistics to note that, commencing with January, 1891, Dr. F. W. Wright, the Health Officer of the city, adopted a more complete form of "Monthly Statement of Mortality," than the one which had been in use for several years. The new reports give in greater detail and completeness the number of deaths from individual diseases, classified according to the sex and age of the decedents.

2. Its attention is directed chiefly to those cases which have been called to its notice by more or less formal complaints.

3. With the exception of epidemic influenza nothing of this kind has come to the knowledge of the writer.

4. The reports of the Health Officer indicate that it has not. During the past year 100 cases and 17 deaths were reported. During the preceding years the cases reported numbered 123, and the deaths 23. If all the cases and all the deaths had been correctly reported, the figures would indicate that the physicians of New Haven have very poor success in the treatment of typhoid

fever. The fact of the matter is, however, that the reports upon which the statistics are based are incomplete. Many physicians either through carelessness, or fear of offending the family and friends of the patient, or on account of an indisposition to comply with the regulations of the Board of Health, do not report all of the cases of typhoid fever which come under their observation. There is also reason to believe that in some instances deaths, which are really due to other causes, are, either through ignorance or an intention to deceive, attributed to typhoid fever.

a. November (1890), August and September (1891).

b. In several cases the belief was entertained that the disease was contracted on Money Island, near Stony Creek, in the town of Branford.

5. It is by most of the more intelligent and more careful practitioners.

6. This disease prevailed to a considerable extent during the winter and spring. The cases varied greatly in severity, many proved fatal, some were exceedingly mild. During the year 372 cases were reported with 30 deaths, during the preceding year 86 cases and 2 deaths were reported.

a. Yes. The principal exceptions to the rule are observed in those cases in which the disease is of so mild a character that the patient is not confined to the bed. In many such cases no physician is called, and the nature of the disease is not found out. In other cases of this kind it is impossible to impress upon the friends of the patient the necessity of exercising such precautions to prevent the spread of the disease, as are eagerly employed in more severe cases.

7. The Board of Health prescribes that the funerals of persons who have died of any contagious disease shall be private, and, whenever requested, or wherever it seems desirable, disinfects the premises.

8. During the year nine deaths were caused by this disease. It prevailed to a moderate extent during the winter and spring.

a. They are somewhat less rigidly enforced than is the case in regard to scarlet fever and diphtheria.

9. The cases reported and the deaths were both considerably less numerous than during the preceding year. There were reported during the year 255 cases with 70 deaths, during the preceding year the corresponding numbers were 330 and 106.

a. The figures given above indicate a mortality of about 27½

per cent. But, as has been mentioned in another connection, the reports are unfortunately incomplete. Many cases occur which are never reported. On the other hand very few, if any, deaths occur from this cause which are not reported. Consequently any conclusion based upon the relation which the number of deaths bears to the number of cases reported would be erroneous. At a rough guess, in the absence of definite and reliable reports, the mortality might be placed at fifteen per cent.

b. The importance of isolation and disinfection are every year becoming more generally understood. They are at present carried out more thoroughly than ever before.

c. It is generally exceedingly difficult to learn any facts of importance with reference to these points.

d. As a rule, to which there are not infrequent exceptions, the general sanitary condition of houses in which diphtheria occurs is not good.

10. During the summer and autumn of 1891 diseases due to malaria were somewhat more common than in 1890.

a. Most of the cases were of the intermittent form, of quotidian or tertian type, and of moderate severity.

11. The water used in the city is obtained from Lake Whitney, Wintergreen Lake, the Maltby Park Lakes, Lake Saltonstall, the Woodbridge Reservoir on West River, and from wells.

a. Yes.

12. Sewers which empty into rivers, or the harbor; vaults and cesspools.

13. They are chiefly embraced in the extension of the sewerage system by the construction of new sewers, in the increased number of buildings which are connected with the sewers, and in the gradual abolition of wells, cesspools and vaults.

14. This is, for the most part, excellent. The adoption by the Common Council of a Plumbing Ordinance, and the appointment of an Inspector of Plumbing, mark another step in the progress of practical sanitation in the community.

15. Good.

16. The Common Council and the Board of Health have each enacted sanitary regulations, the enforcement of which is made a part of the duty of the Board of Health. In this connection, however, should perhaps be mentioned two tracts which were published by the Board of Health, in June, 1889, entitled: "Means to Prevent the Spread of Scarlet Fever and Diphtheria,"

and "Means to Prevent the Spread of Typhoid Fever." These tracts were the result of an earnest effort to formulate a series of rules which any one could understand, which would involve the use of but a single disinfecting chemical agent, which would prove efficient in practice, which would involve a minimum degree of danger in application, and which would be in accordance with the latest results of sanitary investigation. The use of sulphur was entirely ignored, and carbolic acid was adopted as being the chemical which was best adapted for general use as a disinfectant. The proposal to adopt these rules provoked some discussion, but now, at the end of two and one-half years, they are still in use. No proof of their inefficiency has yet been shown.*

NORTH BRANFORD—C. W. GAYLORD, M.D., Reporter.

1. None except influenza during the winter and spring.
2. Only on complaint.
4. No, few cases only.
a. October.
b. Not to my knowledge.
5. Personally, yes.
6. None.
a. Attempted.
7. Immediate and private funeral with thorough disinfection.
8. None.
9. None to my knowledge.
10. Much the same.

* NOTE BY THE SECRETARY.—Our correspondent is quite right in saying these tracts were an effort to formulate rules for disinfection "which any one could understand." But it was an attempt at the impossible. No intelligent sanitarian believes that rules for disinfection can be so simplified that thorough disinfection of sick rooms and their contents can be accomplished by "any one." And all who are well informed on this subject know that "a single disinfecting chemical agent" will not always "prove efficient in practice," and that such teaching is not "in accordance with the latest results of sanitary investigation."

But our correspondent is in error in saying that "these rules now at the end of two and one-half years are still in use." On the contrary, Dr. Wright, the Health Officer of New Haven, informs me that the Board of Health, in the practice of disinfection, relies almost entirely upon sulphur fumigation, which "the rules" ignore; and that the use of carbolic acid for general purposes, was soon found impracticable and is now only used in exceptional cases and quite rarely.

The public should be informed that thorough disinfection is not a trivial undertaking, but on the contrary, to be successfully accomplished, requires in most cases both intelligence and experience.—C. A. L.

11. Springs, wells and cisterns. Much water brought to houses from distant springs.

a. Fairly good.

12. Cesspools and surface drainage.

13. Know of none.

14. Natural drainage only, very good.

15. Very fair.

16. No.

ORANGE—JOHN F. BARNETT, M.D., Reporter.

1. Malarial.

a. To a great extent.

b. The presence of a large pond and some undrained swamps are productive of malarial trouble.

2. More attention has been given to sanitary inspection during past year than formerly, but the Board acts more particularly upon complaint.

3. Four cases of "German Measles" have been reported to Health Officer during year.

4. No.

a. One case in September.

b. The disease was contracted in Wallingford.

5. Yes.

6. During the past winter and two cases just occurred, one malignant, other anginose.

a. Yes.

7. These are under control of Health Officer.

8. To a large extent during fall of 1890 and winter '90 and '91.

a. Parents, physicians and teachers must report to Health Officer under penalty. Isolation and disinfection required.

9. Only two cases, severe but not fatal.

a. No deaths.

b. Yes.

c. No satisfactory conclusion in cases of past year.

d. New house, surroundings apparently sanitary.

10. About the same.

a. Mostly chills and fever.

11. Partly local and partly from New Haven.

a. Local supply poor in hot months.

12. No sewers.

13. No special work.

14. Drainage good.
15. Indifferent.
16. Yes.

OXFORD—LEWIS BARNES, M.D., Reporter.

1. Pneumonia and Bronchitis in January, February and March.

a. They are probably. Much is due to careless exposure when perspiring freely.

2. Only on complaints made and these are few, for every one hesitates to stir his neighbor up, for fear of something worse than unhealthy.

3. None.

4. No.

a. September and October.

b. Yes; one in particular in October, who had been a guest at Pot Island, off Branford, in September.

5. Yes.

6. May and September, few cases and mild.

a. Yes, so far as is practicable.

7. Fumigation. Close caskets and few attendant mourners.

8. But few cases, in May and June.

a. Little, neighbors are cautious.

9. None.

10. Less.

11. Wells and springs.

a. Yes.

12. Surface mostly, a few cesspools.

13. All our farmers who read the papers improve the rear premises.

14. With frequent hills and narrow valleys, with small streams flowing rapidly, drainage is good.

15. Good.

16. No; only to insist that no dead animal shall pollute the brooks and that all such shall be well buried.

PROSPECT—M. N. CHAMBERLIN, M.D., Reporter.

1. Not any.
2. Acts on complaints received only.
3. Not any.
4. Not any cases.
5. Think it is by some.

6. Two cases, no deaths.

a. To some extent.

7. Cannot tell.

8. Two or three cases, no deaths.

a. Not any.

9. No cases.

10. Rather less if any change.

11. Wells and a few springs.

a. Yes.

12. Surface.

13. Not any.

14. Surface.

15. Good.

16. No.

P. S.—Indebted for much of the information to Mr. Plumb, Town Clerk.

SEYMOUR—R. E. WARNER, M.D., Reporter.

1. During winter and spring months, tonsilitis, La Grippe, rheumatism ; summer months, diarrhœa.

a. Only in cases of diarrhœa among children, they being mostly bottle-fed.

2. Only upon complaints received.

4. More so than usual.

a. September, October and November.

b. No, but generally attributed to low water, many wells were dry.

5. Yes.

6. None.

a. Yes.

7. Funerals do not take place as early and are not as private as they should be. Disinfection is practiced.

8. Of a mild type. Confined to four families.

a. Isolation as far as possible.

9. Few cases, generally mild.

a. Two deaths.

b. Yes.

c. By contact and conditions stated below.

d. Bad, usually a foul cesspool connected with kitchen.

10. Less.

a. Mild, no characteristics.

11. Wells and springs.

a. Generally, excepting when very dry, as during fall of this year.

12. Principally vaults and cesspools, a few private sewers into Naugatuck River.

13. None.

14. Good.

15. Indifferent.

16. No.

SOUTHBURY—MYRON L. COOLEY, M.D., Reporter.

1. Diseases of the respiratory tract, with epidemic of pertussis and measles.

2. Only upon complaints.

4. Have seen no cases of typhoid fever this year.

5. Yes.

6. A few cases of simple scarlet fever.

a. Yes.

7. Every precaution is taken to prevent contagion.

8. Epidemic, mild in most cases, no deaths.

9. No cases.

10. More.

a. Tertian.

11. Wells and springs.

a. Yes.

12. No sewerage in town, mainly surface drainage and cesspools.

13. None.

14. Good by nature.

15. Good.

16. No.

WALLINGFORD—W. S. RUSSELL, M.D., Reporter.

1. Measles, typhoid fever, scarlet fever.

a. No.

2. Our board of health is a dead letter.

4. Yes.

a. September and October.

b. It has been traced in several instances to improper drainage and bad plumbing.

5. Yes.

6. Scarlet fever in a mild form is very prevalent here at present.

a. As much as possible, but for many mild cases the physician is not called in and no precautions taken.

7. The physician in charge usually gives directions as to the proper precautions.

8. Measles was very prevalent during the spring months, in a mild form usually. It showed a disposition to attack adults, and most of the adults in town who had not had it were attacked and some very severely, too.

9. We have had very little diphtheria.

a. None, I think.

b. Yes.

10. About as usual.

11. Pistapaug Lake.

a. The best.

12. Our sewer empties into the Quinnipiac River.

13. We have had sewers laid on several streets and people are more generally connecting with them than formerly.

14. Good.

15. Water supply the best, sewage disposal good, drainage good.

16. No.

WOODBRIDGE—J. W. BARKER, M.D., Reporter.

1. Think none specially prevalent.

2. Usually acts when there are complaints made, which have recently been caused by one or two individuals feeding hogs on garbage. Question : Is this likely to cause sickness?

4. No, rare if at all.

6. No scarlet fever.

8. No measles during the year.

9. No diphtheria during the year.

10. Should think fewer cases had been imported from abroad than usual and character had been milder; probably owing, in a measure at least, to the dryer season which has just closed.

11. *a.* None better.

12. Nature has usually provided for that in the hilly nature of the country.

15. As a general thing good.

16. No.

NEW LONDON COUNTY.

BOZRAH—NATHAN JOHNSON, M.D., Reporter.

1. I think there has been less sickness from any and all causes than for many years. Those diseases most prevalent, I think, have been of the respiratory organs, pneumonia, Grippe and colds traceable to climatic causes.

2. Our board of health acts only upon complaints received.

4. Typhoid fever broke out in this town in August and continued through September. There were three cases all in one house of rather a severe type, two of which were fatal. The disease, it was thought, was traceable to a cesspool near the house. It did not spread in that locality. I have at this writing a case in a tenement house in a mill village, not traceable, family just moved in. These four are all the typhoid cases I have seen during the year.

5. Disinfection of the excreta of typhoid patients is insisted upon.

6. Cannot recall a case.

a. It is insisted upon by physicians but many of the people are ignorant and careless about isolation and disinfection.

7. Usually no funerals are held over those who die from contagious diseases, and the houses are disinfected in most cases as well as the bodies.

8. Have seen more cases of measles during the past year than for many years. They were mostly of a mild type, none fatal, and prevailed in spring and early part of summer. No restrictive precautions, disease spread through the schools mostly.

9. In January and February it broke out in a dangerous form in a remote part of the town and thinly settled. There were four cases, father and three children, of which one, a boy, died. Not traceable. No other cases. Visiting the sick was restricted. House drainage was by sink drain.

10. Have seen less malarial troubles.

11. Wells and springs.

a. Yes.

12. Cesspools and on surface.

13. None.

14. Natural toward river.

15. Good.

16. None.

COLCHESTER—M. W. ROBINSON, M.D., Reporter.

1. La Grippe and measles.
2. Upon complaints received and upon all unsanitary conditions coming to their knowledge.
4. Very few cases.
a. September and October.
b. No.
5. Yes.
6. Very few cases and of mild type.
a. Always.
7. Usually funerals are private and thorough disinfection insisted upon.
8. Very prevalent in late spring and early summer, not of severe type and few complications.
a. Isolation of patients and disinfection as far as practicable.
9. None.
10. Less.
a. Very few pronounced cases. A few cases of typho-malarial fever.
11. Wells on premises generally.
a. Yes.
12. Cesspools covered and upon surface.
13. None worth mentioning.
14. Surface drainage.
15. Not good, but as good as the average of country towns.
16. No.

FRANKLIN—NATHAN JOHNSON, M.D., Reporter.

1. Those of respiratory organs, pneumonia, Grippe and colds, and rheumatism, due to climatic causes.
2. Only on complaints received.
4. Do not know of a case.
5. Always by the physicians.
6. Have not seen a case the past year.
a. Isolation and disinfection are usually practiced.
7. Usually not any precautions are observed.
8. Have not seen a case during the year.
a. No restrictive precautions are observed.
9. None, I think.
10. About same and of an irregular character.
11. Wells and springs.

a. Yes.

12. Cesspools.

13. None.

14. Natural.

15. Good.

16. No.

P. S.—The above concerns only my own practice.

GRISWOLD—GEO. H. JENNINGS, M.D., Reporter.

1. During latter part of winter and spring La Grippe, cases not so severe as in the previous year.

2. Upon complaints received or *accidental* discovery, no systematic inspection practiced.

4. No.

a. October, 1891, three cases; but one other reported for year.

b. Yes, to well on mill property, same source as cases in year previous.

5. Not by all.

6. But few cases and those generally of mild type.

a. Not by all.

7. It is intended, though probably not always a fact, that the body shall be wrapped in cloth saturated with disinfectants; no exposing of body afterwards; funeral private and as soon as practicable. Rooms to be disinfected by burning sulphur.

8. A few cases in May, June and July.

a. None usually.

9. Present every month in the year. More common than any contagious or infectious disease; no epidemic. Some cases severe, having type of so-called croup.

a. Cannot give it.

b. Not by all.

c. Eight cases under my care. Began by being brought from Canada. Family stopping over night who had the disease with them; had buried three children just before leaving Canada.

d. A few bad, generally not so.

10. Less.

a. In a few of the regular tertiary form. More frequently not distinctly marked, and frequently complicating some other disease.

11. Wells and springs generally. In Glasgo, a small village in the eastern part, from reservoir.

a. Usually, yes.

12. One village well drained, others either surface discharge or cesspools.

13. The village known as "Slaters" has been thoroughly drained, every house well connected with drain.

14. In most cases every house has its own drain.

15. Indifferent.

16. Yes.

GROTON—A. M. PURDY, M.D., Reporter.

1. La Grippe.

a. Atmospheric origin undoubted. There seems to be a greater tendency towards pneumonia than last year (as a complication).

2. Upon complaints received only.

4. No.

a. September and October.

b. Three cases in one family was believed to have originated from the use of impure well water, by advice the well was cleaned out and a dead cat removed.

5. So far as I know.

6. About fifteen cases, mostly of a mild type.

a. I believe so.

8. Have had or heard of none.

9. Few cases.

a. One death.

b. To some extent.

c. No.

d. Poor.

10. Rather less, I think.

11. Good system of water works.

a. Yes.

12. Cesspools only.

13. None.

14. Poor.

15. I should say good.

16. Yes.

LISBON—GEO. H. JENNINGS, M.D., Reporter.

1. La Grippe during winter and spring.

4. No.

5. Not by all.

6. No cases known.

a. Not by all.

7. By direction of attending physician body to be enclosed in sheets wet with disinfectant. Public funerals discountenanced.

8. None known.

9. Few cases, mild type.

a. Could not say.

b. Not always.

10. Know of no cases.

11. Wells and springs.

a. Yes.

12. Cesspools and surface.

15. Indifferent.

16. I think not.

LYME—J. G. ELY, M.D., Reporter.

1. Typho-malarial fevers and dysentery.

a. No. More cases of continued fever in this town than in six preceding years.

2. Acts only on complaints received.

3. None.

4. Yes.

a. September and October.

b. No.

5. Yes, as far as I know.

6. None.

a. Where the former is possible, yes ; the latter, always.

7. Notice given of character of disease and the public *advised* to stay away.

8. None.

9. None.

b. Yes.

10. More.

a. As remittent fevers.

11. Wells and springs.

a. Yes, unless in times of severe drought.

12. Cesspools and sink drains.

13. None.

14. No general improvement, a few bad cases have been rectified.

15. Fairly good.

16. No.

NEW LONDON—A. N. ALLEN, M.D., Reporter.

1. Typhoid fever, Grippe, diseases of childhood and of old age.

2. Systematic inspection in May, not thorough, and during the year upon complaint.

3. Grippe, infectious.

4. Twenty cases of typhoid especially noticeably this year, as in previous years of late no cases have been reported or very few.

a. July, August, September, October. In all but twenty cases mortality not large, small.

b. Usually to vaults or cesspools, and dried ordure in privies. Hardly a case originating in a house connected with a city sewer and thereby subject to the plumbing ordinance. This ordinance regulates the plumbing of all houses so connected, and at least four-fifths of the plumbing of the city or more has thus been made sanitary.

5. By regular physicians.

6. None.

a. Usually, especially by regular physicians.

7. Disinfection and private burial; absence of public concourse.

8. Hardly any.

a. Cases reported and some isolation.

9. None reported that I recall.

b. Somewhat.

10. Less.

a. Mild. A few cases of fever reported as malarial. The real quality of the disease may be malarial or typhoid. The report of this or that depends on the physician who reports.

11. From Lake Kononac.

a. Yes. Sometimes odor from fresh-water sponge in June, water then not unhealthy.

12. Two-thirds of population by city sewer.

13. One mile of city sewer, two new school houses. Need one or two more new houses for school children, about 1,200 children.

14. Natural drainage usually good, except where accumulation or bad direction results from ledge formation.

15. Good.

16. No, they sometimes issue printed instructions and special printed orders.

NORTH STONINGTON—E. H. KNOWLES, M.D., Reporter.

1. None.

2. The board does not make thorough inspections but acts upon such as comes under their notice, and upon all complaints.

3. None.

4. No, I do not think there has been a case in town.

5. I think it is.

6. There has been but very few cases and those of a mild type.

a. It is.

7. Usually fumigating and disinfectants are used.

8. Few cases, mild type.

a. None.

9. But very few cases, mostly mild.

a. No deaths.

b. Yes.

c. There has been no spreading, all the bad cases have been imported.

10. Less.

11. Wells and springs.

a. Yes.

12. Surface.

13. None.

14. Fair.

15. Fairly good.

16. No.

NORWICH—LEWIS S. PADDOCK, M.D., Reporter.

1. None; the year has been remarkably healthy.

2. Generally upon complaint. But if there is a sudden or unusual outbreak we investigate without delay.

3. I know of none.

4. No.

a. I do not recall a case this year except in the country.

b. No.

5. Yes.

6. Not frequent, and mild.

a. They are demanded by physicians generally, but I fear ignorance and prejudice sometimes oppose them.

7. We forbid public funerals, have the bodies buried as soon as possible, and disinfect the house where the sickness existed.

8. I have seen none this year.

9. A few rare cases, not very severe.
a. I do not know.
b. Yes.
c. No.
d. Fairly good.
10. About the same.
11. A reservoir supplied by springs.
a. Yes; sometimes has vegetable impurities.
12. By sewers emptying in the river.
13. Partially covering an offensive brook and more sewers.
14. Surface drainage finds the sewers, and thence the river.
15. Good.
16. No.

Old Lyme—Geo. W. Harris, M.D., Reporter.

1. None.
2. Neither. When there are complaints we make inspections, and at other times when advisable.
4. No.
5. Are buried, and receptacles flushed with boiling water.
6. Quite prevalent during early spring.
a. More or less so.
7. The use of disinfecting solutions, principally mercurial, and recommendation not to attend.
8. Rare and mild.
a. Advisory.
9. Very few cases, sporadic.
a. No deaths.
b. Partially.
c. Acute catarrhal irritation of fauces affords most favorable conditions for infection.
10. Less.
a. Mild.
11. Wells.
a. Yes.
12. Cesspools.
14. Natural.
15. Good.
16. It has not.

PRESTON—O. F. HARRIS, M.D., Reporter.

1. Rheumatism.

a. No.

2. Acts upon complaints received.

3. None.

4. No.

5. Yes.

6. None.

a. Yes.

7. Ordinary cleanliness.

8. None.

9. None.

10. No malaria.

11. Aqueduct.

a. Yes.

12. Yes.

14. Good.

15. Good.

16. No.

SALEM—C. F. CONGDON, M.D., Reporter.

1. Nervous diseases, rheumatism, diseases of the lungs, measles, dysentery, malaria, La Grippe, hives.

2. No inspections are regularly made. The past year is the first that I have been health officer. When occasion has required I have done what I thought was needed at the time. Before we have had a health committee and "any ordinary case of labor" that it might be necessary for them to officiate at would be a back number before the committee could "get into gear."

4. No, one case in August.

a. Very severe, it recovered.

b. Other doctors think not, I have my doubts about it. I think the well and sink were too close for safety.

5. No. In the one case above they were carefully disposed of and everything around the patient disinfected. During the worst of it the discharges were burned.

6. No scarlet fever.

a. I should insist on it if I had any cases.

7. We don't have any such deaths. If there was an occasion for it I should advise that no public funeral be held and that thorough disinfection be practiced.

8. In the winter and spring there were a good many cases, they got to going before the danger was realized. At one time I knew of 127 cases that had sprung from one case.

a. I ordered those exposed to stay at home and kept the disease out of the school and thickly settled part of the town.

9. One or two mild cases.

a. None.

b. Yes.

c. It has lurked around the Gates Hill district for three years and every year crops out.

d. Sanitary condition is fairly good. The cases are months apart and are not the result of immediate contagion.

10. More.

a. Regular western chill fever and sweat either every day or every other day.

11. Wells.

a. In most cases.

12. That of ordinary New England farm houses.

13. None.

14. Just as nature left it.

15. Good, because the Lord made it so. The house owners are too often indifferent.

16. No. The board does not have a cent to issue anything with. All that can be "issued" is "talk," and that luxury could not be indulged in if it cost anything to the town.

Sprague—T. I. Stanton, M.D., Reporter.

1. No special disease.

2. Only on complaints received.

4. We have had no cases.

5. Yes.

6. No cases.

a. Yes.

7. All necessary precautions are observed and disinfection.

8. None.

a. Not to the extent of scarlet fever.

9. No cases last year.

b. Yes.

c. No.

d. Good.

10. No.

a. Very mild.
11. Wells.
a. Yes.
12. Top of the ground.
13. We need no improvement at present.
14. No improvement.
15. Good.
16. Yes.

STONINGTON—FRANK A. COATES, M.D., Reporter.

1. No diseases specially prevalent.
b. It has been a year of more than usual health.
2. Only upon complaints received.
3. None.
4. No.
5. The excreta are usually burned.
6. Few cases, mild in character and rarely followed by sequelæ.
a. Yes.
7. The funerals are private and the disinfection is in most cases thoroughly done.
8. Very few cases.
a. There are seldom restrictive precautions taken against measles unless there is an epidemic of a severe form.
9. Have only seen six cases, these malignant.
a. One to six.
b. Yes.
c. Could not tell the cause, all the cases were in one family.
d. In this case the sanitary condition of the house *seemed* fairly good.
10. Less.
a. Mild.
11. Wells, cisterns and a good system of water works.
a. Yes.
12. Cesspools and the natural drainage through the soil.
13. With the exception that people each year pay more attention to their own premises, none.
14. None.
15. Fairly good.
16. Yes.

VOLUNTOWN—WARREN R. DAVIS, M.D., Reporter.

1. There has been none; La Grippe of late is quite prevalent.

2. Our board, I am sorry to say, do not act systematically, only on cases as they are referred to.

3. We have a humor similar to the army itch that is very obstinate to treatment.

4. No, only a few cases.

a. September and October.

b. No, it has not.

5. Yes.

6. Only a few cases (simplex).

a. Those that are handled by the doctors are, but some cases do not employ a doctor.

7. Proper precautions are usually observed.

8. Have not had a case.

9. Several cases of the benign type.

a. No deaths.

b. Yes.

c. None.

d. Some are quite good, others bad.

10. I do not think there has been so many cases.

a. Tertian mostly, some few quotidian.

11. Wells and cisterns.

a. Quite good, except in the fall and spring.

12. Usual way.

13. None.

14. Fair.

15. Bad.

16. No.

FAIRFIELD COUNTY.

BETHEL—A. E. BARBER, M.D., Reporter.

1. Typhoid fever, complicated in some cases with malaria.

a. No discovered cause.

2. Only on complaint.

4. Yes, during the last month.

a. October.

b. No.

5. Yes.
6. Not very prevalent, a few sporadic cases.
a. Yes.
8. Very few cases.
9. Occasionally a few cases, not prevalent.
a. Very small.
b. Yes.
d. Fair.
10. Less.
a. Mild.
11. From reservoir two miles distant.
a. Yes.
12. Fair, not extra.
15. Good.
16. No.

BRIDGEPORT—N. E. WORDIN, M.D., Reporter.

1. Consumption, diarrhœa, pneumonia, diphtheria, diseases of the nervous system.

a. To a considerable extent.

2. I believe that it acts only upon complaints received or upon notification of disease. There has never been a systematic sanitary inspection of our city.

4. It has.

a. September and October.

b. I do not know. There was a nucleus of the disease at the County Jail. An occupant having been discharged developed symptoms after his arrival in New York. It was found that he was sick when admitted. Shortly afterwards six more were taken with typhoid fever and were sent promptly to the General Hospital. One of them died, the others recovered. Careful investigation failed to reveal adequate cause for the disease. All the cases occurred in the new building, the sanitary outfit of which is thought to be complete. It was found that some of these patients had been extremely filthy in their habits, and that in no cases had the closets been flushed after using. Orders were at once given by the physician in charge to have the hallman flush all the closets regularly every morning. In this connection I would like to call attention to that part of the Secretary's Report for the year 1885, which is found on pages 124 and 125 of that year. I believe that the kitchen as there described is still used for cooking for the patients.

5. I believe that it is.

6. Two hundred and eighty-five cases have been reported; regular type.

a. Yes.

7. In deaths from diphtheria funerals are soon after death, limited to the family and disinfection is performed.

8. Two hundred and ninety-four cases have been reported.

a. Scholars are not allowed to attend school while there is a case of measles in the same house.

9. One hundred and forty-one cases have been reported.

a. One-third, or 33 per cent.

b. Yes.

d. The cases have been chiefly among the laboring class or the poor.

10. Less.

a. Remittent fever and irregular forms of malaria.

11. Small streams dammed to form small ponds.

a. Fair.

b. Yes.

12. Upon the mud flats of the harbor and adjacent creeks.

13. Some of the mud flats are being gradually covered.

14. Fair.

15. Water supply good, sewage disposal bad, drainage good.

16. It has not. Since the last city election in April, 1891, the board has had no meeting.

Brookfield—A. L. Williams, M.D., Reporter.

1. None.

2. Only upon complaint.

4. Not a case.

5. Yes.

6. None.

a. Yes.

7. Funerals private, followed by disinfection.

8. Have had none.

9. Two or three cases reported, one fatal.

b. Yes.

c. I cannot, the surroundings of premises pronounced exempt from censure.

d. Good.

10. Much less.

a. Have not seen a typical case.

11. Wells generally, some through lead pipe.

a. Yes, ordinarily.

12. No sewerage.

13. None.

14. None required in particular.

15. Good.

16. No.

Darien—Wm. F. French, M.D., Reporter.

1. Epidemic influenza during March and April, more fatal than during 1890. Ten deaths can be directly traced to the epidemic or its sequelæ. There has been a slight return this autumn.

2. Corrects unsanitary conditions when known to exist.

3. Had a case of Addison's disease, duration four and one-half years; also case of bilious remittent imported from Florida.

4. Five cases so far this year.

a. October.

b. In my two cases it was due to a cesspool without ventilation except through a sink without a trap. The low condition of the wells, owing to lack of rain, caused people to drink from whatever source they could obtain a supply.

5. Yes.

6. None.

7. Generally private burial.

8. Very little this year.

9. A few cases, mild.

b. Yes.

c. Thought it might be due to defective well at the district school.

d. Fair.

10. Less.

a. A few cases with genuine chill, most are chronic.

11. Wells.

a. Except during the dry season.

12. Water closets, surface drainage.

14. Generally good.

15. Good.

16. No.

DANBURY—E. A. STRATTON, M.D., Reporter.

1. Typhoid fever, malarial troubles and whooping cough.
a. In most of typhoid cases.
4. Yes.
a. August, September and October.
b. Yes. Eight cases contracted the disease at Money Island, and four at a boarding house under which passes a sewer (open) receiving the sewage of a large section of the city.
5. Yes.
6. Few cases and a mild type.
a. Yes.
7. Funerals private and as soon after death as possible.
8. None.
a. None.
9. Very few cases and very mild.
a. Small.
b. Yes.
c. No, we have had no spreading.
d. Usually poor.
10. More.
a. Intermittent fever, typhoid malaria, some remittent.
11. Kohanza and Padauaram reservoirs.
a. Yes.
b. Good, but scarce for two months.
12. Our system not completed.
13. A large number of public sewers.
14. Good.
15. Water supply good, good drainage, and good prospects for sewage disposal.
16. Yes.

FAIRFIELD—W. H. DONALDSON, M.D., Reporter.

1. La Grippe and conditions following it.
2. Only on emphatic complaints.
4. About the same, few cases.
a. The fall.
b. No.
5. Always.
6. Mild, almost none.
a. Yes.

7. None by the authorities, the physicians try to have the laws and instructions of the State Board carried out.

8. About as usual, mild.

a. Disinfection and limited quarantine.

9. A few cases, two or three, mild.

a. None.

b. Strictly.

d. Some of them fair.

10. Very much more.

a. Intermittent, remittent and malarial complications.

11. Wells.

a. Fine, until July, since which time it has been very limited.

12. Cesspools mostly.

13. None, except the removal of a piggery from the village to a distant part of the town.

14. Excellent in most parts.

15. Excellent.

16. Yes.

GREENWICH—SPENCER FRANKLIN, M.D., Reporter.

1. Measles.

b. A malarial diathesis complicates a large proportion of diseases of all kinds.

2. Principally upon complaints received.

3. The Grippe and one case of perityphlitis with recovery; one of small pox.

4. No.

a. October and November.

b. In one case to contaminated well water.

5. It is.

6. Forty-seven cases prevailing type scarlatina simplex.

a. They are.

7. House is fumigated and everything in the sick room, clothes, bedding, etc., burned or boiled; funerals private.

8. Epidemic, two hundred and nineteen cases.

a. Isolation.

9. Malignant, four cases.

a. Ninety per cent.

b. Yes.

c. Early cases imported from New York City.

d. Bad.

10. About the same.

a. Mostly of quotidian variety. Owing to the high location of the town I think there is less malaria and that of a milder type, occurring more as a complication than a separate disease.

11. Putnam Lake, about four miles from the village.

a. Very, it lasted all through the dry season of the past summer.

12. The Long Island Sound.

13. The draining of a large swamp and the extension of the sewers.

14. It is very good.

15. Very good.

16. No.

Monroe—J. C. Stevens, M.D., Reporter.

1. There have been no diseases specially prevalent.

b. A remarkably healthy year.

2. Only upon complaints received.

4. No.

5. Yes.

6. None.

a. Yes.

8. None.

9. None.

b. Yes.

10. Less.

a. Mild.

11. Wells and springs.

a. Usually, drought this year has caused some wells to give out, especially during the autumn months.

12. Usually surface, some sinks.

13. None, there having been no special call for such.

14. Good.

15. Good.

16. No.

New Canaan—W. C. Brownson, M.D., Reporter.

1. None specially prevalent since the Grippe.

2. Only upon complaints received.

3. None.

4. Only one case during year.

b. No.
5. By some of them at any rate.
6. None.
a. Yes.
7. The usual ones.
8. Not a half dozen cases.
a. None.
9. Two cases. One mild, recovery. One severe, now under treatment.
c. No.
d. Good.
10. Less. Practically none.
11. Wells and springs.
a. Not this summer.
12. No system of sewerage.
13. None.
14. Fairly good.
15. Indifferent.
16. No.

NORWALK—J. G. GREGORY, M.D., Reporter.

1. Measles, scarlet fever, typhoid fever.
a. Only in some instances.
2. Upon complaint received, as a rule, making occasional inspection only when neighborhoods suspected of unsanitary conditions.
3. La Grippe—most prevalent in April.
4. Yes.
a. November, 1890, September and October, 1891.
b. Yes. In several cases it has been traced to poor drainage and impure potable water. Sewage and slops percolating into wells and also water closets.
5. Yes, as a rule.
6. One or more cases have been reported every month except September. Type mild. Mortality .02 per cent.
a. Yes.
7. Absolutely private burial under sanitary conditions.
8. Epidemic.
a. Quarantined, so far as possible. Commenced with a single case, imported in February, and from this it spread through the town, reaching its height the last of April and disappearing in June.

9. Reported every month except April. Sporadic, severe.
a. About 25 per cent.
b. Yes.
c. No.
d. Some poor while others are in good condition.
10. About the same.
a. Intermittent fevers, neuralgia, and some forms of irregular fever.
11. From storage reservoirs and water systems.
a. Yes, with the exception of the borough, temporarily this fall.
12. Carried by sewer system into Sound.
14. Good.
15. Good.
16. No.

Redding—R. W. Lowe, M.D., Reporter.

1. Malaria and malarial diarrhœa, due to the wells and streams being very low.
2. It acts upon complaints only.
3. Epidemic Influenza the only strange disease.
4. A few isolated cases.
a. August, September and October.
b. No.
5. Yes.
6. A number of cases scarlet fever of mild type.
a. Yes.
7. Fumigation of rooms and only the immediate friends allowed to attend funeral.
8. Two cases during summer months, type mild.
a. None to speak of.
9. Only once, case recovered.
b. Yes.
a. Very strict isolation of patient and nurse, disinfect everything used about patient.
10. Less.
a. Remittent and intermittent malarial.
11. Wells and springs.
a. Usually, wells low for half the year, many wells have given out entirely.
12. Very poor.

13. None to my knowledge.
14. None.
15. As good as average country town.
16. No.

RIDGEFIELD—WM. S. TODD, M.D., Reporter.

1. Nothing specially so.

b. With exception of the grippe the health of the town has been above average.

2. The latter.

3. In April and May a large number of cases of Influenza, La Grippe.

4. No cases.

5. Yes.

6. None.

a. As far as possible.

7. Funerals private, thorough washing of rooms and families, disinfectants used.

8. But a few cases.

a. None.

9. None.

10. None.

11. Wells, some bored, mostly dug.

a. Generally, there has been a great scarcity this fall, but have seen no bad effect on the health of the community yet.

12. By cesspools, with frequent cleaning, deposits buried or added to dung hill.

13. None.

14. None.

15. Indifferent.

16. No.

STAMFORD—F. J. ROGERS, M.D., Reporter.

1. Cholera infantum.

a. Disregard of sanitary laws.

2. Both.

3. None.

4. No.

a. September.

b. Drinking well water.

5. Generally they are.

6. Not many cases. Generally mild.
a. Yes.
7. Funerals private. Disinfection ordered.
8. Very rare; mild.
a. Isolation, fumigation.
9. Quite prevalent, virulent.
b. Yes.
c. No.
d. Poor.
10. About the same.
a. Mild.
11. Trinity Lake; good.
a. Very good.
12. Long Island Sound by system of sewerage.
13. Taking steps to fill in old canal.
14. Pretty good.
15. Very good.
16. Yes. Enclosed please find copy of same, which I submitted and had passed at last meeting of Health Board.

STRATFORD—WM. B. COGSWELL, M.D., Reporter.

1. None specially prevalent.
2. Act only upon complaints received.
4. No cases.
5. Yes.
6. A few mild cases.
a. Yes.
8. Only one light case.
a. In general isolation is practiced.
9. Two mild cases.
a. No deaths.
b. Yes.
c. Disease contracted in Bridgeport in one case; bad sanitary condition of house cause of the other.
d. Not good.
10. About the same.
a. Remittent.
11. Wells.
a. Yes.
12. Cesspools and surface of the ground.
13. None.

14. Surface.
15. Good.
16. No.

TRUMBULL—SETH HILL, M.D., Reporter.

1. La Grippe in the first of the year.
a. No.
2. Complaints received.
3. None.
4. Not any.
5. Generally.
6. Not any.
a. Yes.
7. Private funerals and general disinfection.
8. None.
9. None.
10. Less.
11. Wells.
a. Not this year.
15. Like all country towns.
16. No.

WESTON—FRANK GORHAM, M.D., Reporter.

1. None.
4. Less prevalent than usual.
5. Yes.
6. None.
8. None.
9. A few mild cases.
b. Yes.
10. More.
a. Mongrel.
11. Wells and cisterns.
a. Usually good, but a great scarcity this year.
14. Good.
15. Indifferent.
16. No.

WESTPORT—L. T. DAY, M.D., Reporter.

1. La Grippe, malaria, rheumatism.
a. No.

b. There has been recently almost an epidemic of Follicular tonsilitis.

2. Only upon complaints received.

3. None.

4. Yes.

a. April, October and November.

b. In one case to a well, four people contracting the disease from this well. One; my patient was in the habit of visiting at the house and in that manner obtained the disease.

5. Yes.

6. Mild and few cases. Several cases in Green's Farms with two deaths.

a. Yes.

7. Funerals are conducted as private as possible and the corpse is not exposed to view.

8. None to speak of. I believe there were a few cases, one imported from Germany.

9. What there has been was severe and accompanied by croup.

a. Two-thirds.

b. Yes.

c. No.

d. Poor.

10. Less.

a. Mostly of a chronic character.

11. Wells and cisterns.

a. Fair.

b. Until this year, yes.

12. Cesspools mostly.

13. None.

14. Good.

15. I should say generally good.

16. Yes.

Wilton—A. B. Gorham, M.D., Reporter.

1. None, unless "La Grippe" during winter and spring; usual summer diseases, as dysentery, in adults, cholera infantum, in children.

3. La Grippe, although that does not seem to be very rare or strange now.

4. About usual amount of typhoid.

a. September, October and November.

b. No.
5. Yes.
6. Few cases ; usual severity, no deaths.
a. Yes.
7. Funerals private ; thorough disinfection of apartments, clothing and furniture.
8. No measles within the year.
9. No diphtheria.
10. Rather more.
a. Mixed, neuralgic, digestive disturbances, intermittent.
11. Wells and springs.
a. Yes.
12. Surface drainage principally.
14. Good ; surface drainage.
15. Good.
16. No.

WINDHAM COUNTY.

Brooklyn—J. M. Coburn, M.D., Reporter.

1. None.
2. On complaint.
4. No.
a. October and November.
b. No.
5. Yes.
6. Not any.
a. Yes.
7. Private funerals and disinfection.
8. Only one or two mild cases.
a. Not any.
9. One fatal case.
b. Yes.
d. Bad.
10. Not any.
11. Wells.
a. Yes.
13. The published rules and regulations of the Board of Health has reorganized some pig styes and cleaned out some cellars.

14. Good surface.

15. Good. The town has the reputation of being painfully clean.

16. Yes.

CANTERBURY—E. D. KIMBALL, M.D., Reporter.

1. None.
2. Only upon complaints received.
4. No.
5. Yes.
6. No cases.
a. Yes.
7. Fumigation and disinfection.
8. A few cases.
a. Isolation.
9. No cases.
b. Yes.
11. Private wells.
a. Yes, generally.
12. Good.
13. None.
14. Good.
15. Indifferent.
16. No.

CHAPLIN—ORIN WITTER, M.D., Reporter.

1. Rheumatism, bronchitis and diarrhœa.
a. No.
2. Only on complaints received.
4. Only two cases.
a. November.
b. I think in one case to impure drinking water from a well.
5. Yes.
6. None.
a. Yes.
7. We have had no deaths caused by contagious diseases.
8. Mild type.
a. No.
9. None.
a. None.
b. Yes.

10. Less ; not a case.
11. Mostly from wells.
a. Yes.
12. None.
13. None.
14. Good.
15. Good.
16. No.

EASTFORD—E. K. ROBBINS, M.D., Reporter.

1. None.
2. Only upon complaints received.
4. Less than last year.
a. September and October.
b. It has not been traced to any special source.
5. Yes.
6. Not a single case.
a. Always.
8. Four cases during January and February.
a. Always practiced by me.
9. Eight cases ; five, putrid form.
a. Five deaths.
b. Always.
d. The five cases were in one family, the father and four children. They lived in a poorly-constructed shanty situated on the side of an old swamp with much stagnant water during the year. Under the shanty was a space of about three feet, where one hog and one sheep made it their home. With the filthy condition of the shanty and its surroundings, it is not strange they should have the putrid form of diphtheria and die. After the death of all, the shanty, all the bedding, clothes, etc., were burned up. The three cases, mild form, I have not been able to trace to any cause whatever.
10. Nearly the same.
a. Mild form.
11. Wells and springs.
a. Yes.
12. Surface.
14. Good.
15. Good in most cases. It has been a year of unusual health.

HAMPTON—H. H. CONVERSE, M.D., Reporter.

1. Influenza and la grippe symptoms.
2. The Board act only upon complaints received.
4. Only two cases.
b. No.
5. Yes.
6. Two light cases.
a. Yes ; in all cases that is the way I stopped the spread.
7. I have had no occasion to direct any funerals of that nature.
8. Nine cases.
a. Nothing but the closing of the district school for a time.
9. Not one.
10. About the same.
11. Good springs, and wells supplied with them.
a. Yes.
12. Proper in the most of places.
13. The removal of some privies and drains.
14. Quite good.
15. Good as a rule.
16. After being appointed by the State Board last year I had a code printed and put on each sign-post in town. I think it should be required of every town.

DANIELSONVILLE-KILLINGLY—W. H. JUDSON, M.D., Reporter.

1. Influenza (grip).
a. No.
3. None.
4. No.
a. Not much anyway.
b. No.
5. Yes.
6. Not much ; light.
a. No.
7. Fair sanitary ; good undertakers.
8. None.
9. Very little.
a. Don't know.
b. Yes.
c. Not spread.
d. Bad.
10. Same.

a. Light.

11. Aqueduct from mountain brook; iron pipes.

a. Very.

12. Mostly surface; some small ones into Quinnebaug.

13. Gradual discardal of old wells and putting in city water.

14. Fair.

15. Only waiting for general sewer.

PLAINFIELD—CHAS. N. ALLEN, M.D., Reporter.

1. Typhoid fever.

a. Uncertain.

2. Acts only on complaints.

4. Yes.

a. September and October.

b. I believe not.

5. Yes.

6. Few cases; mild.

a. Yes.

7. Nothing systematic.

8. None.

9. Only a few mild cases.

b. Yes.

d. Poor.

10. About the same.

a. Mild and easily controlled.

11. Wells.

a. Fair; scant in summer.

12. Cesspools generally.

14. Good so far as utilized.

15. Indifferent.

16. No.

POMFRET—F. G. SAWTELLE, M.D., Reporter.

1. No prevailing disease.

2. Acts on complaints; have made no inspections past year.

4. One case of low fever; cause, broken pipe in plumbing; the hole closed by plumber with a piece of tin.

5. Yes.

8. A few cases in the spring; very mild.

9. Very few cases.

a. None.

b. Yes.
c. Cause, due in one case to sink drain escaping in cellar.
11. Springs and wells.
a. Yes; sometimes limited a little in long dry seasons.
12. Waring system, cesspools and surface.
15. Good.
16. No.

SCOTLAND—E. D. KIMBALL, M.D., Reporter.

1. None.
2. Only upon complaints received or noticed by the physician.
4. No cases.
5. Yes.
6. None.
a. Yes.
7. Thorough fumigation and disinfection.
8. No cases.
9. None.
10. Less I think.
11. By private wells.
a. Generally.
12. Good.
14. Good.
15. Good as the average of any country town.
16. No.

THOMPSON—L. HOLBROOK, M.D., Reporter.

1. As in the years past, the diseases especially prevalent have been those of climatic origin, viz: in the cold months; those of the respiratory organs, and the various neuroses, such as pneumonia, bronchitis, and la grippe with its varied complications, in many cases terminating fatally among the more feeble and aged. The diseases prevalent in the summer months have been less so than in other years,—less of diarrhœal and dysenteric troubles.

2. The Board of Health does not make sufficiently systematic inspections to be constantly informed of particular conditions in every instance, in the wide field of observation, and is too much limited to action, based upon complaints received, after an outbreak of contagious disease has already appeared. A stated, frequent, careful, thorough and systematic inspection, which involved the expenditure of no small amount of time and labor, ought to be the imperative duty of a Board of Health, for which ample

provision should be made by law at the expense of the town. But not feeling obligated to perform such labor, and if actually empowered by existing law, I fear most Boards of Health would fail in this respect from lack of appreciation of duty, and perhaps the fear of censure for incurring a public expense for which a majority, or large minority, of the people fail to comprehend the importance or necessity.

4. Typhoid fever is prevailing quite extensively in populous manufacturing villages of the town, and at the present time, November 12th, on the increase in number of cases, as if spreading by contagion or the effect of the original causes, to which one after another succumbs, till a number of the same family are prostrated simultaneously.

b. The cause or causes of typhoid are not clearly apparent; but we may conjecture that as factors in the problem, the low condition of streams, ponds and wells has a share, together in many cases with the neglect of proper hygienic conditions, in relation to drainage, cesspools and privies, in thickly inhabited quarters.

5. Disinfection of excreta of typhoid patients and of others suffering from contagious diseases is regarded by our physicians a necessity, though not always, I fear, as carefully enjoined and faithfully practiced as is desirable.

9. Diphtheria, for the last four years absent from this region, now exists in grave form, though as yet sporadically, and is also reported on the line of the rivers, both north and south of us. It is too early in its inception to know whether it is to become epidemic.

10. We have but little well marked malaria, indigenous to this latitude, but the frequent neuralgic troubles seem to assume a periodical nature, which strongly savors of the malarial element, and suggest the use of some of the salts of quinia.

15. The general sanitary condition of this town, as regards water supply, sewage disposal and drainage, is not the best, when taken as a whole, neither as bad as might be; but might be much improved, with great gain to the public health, in many localities.

WINDHAM—CHAS. JAMES FOX, M.D., Reporter.

1. Malarial typhoid fevers, pneumonia and catarrhal diseases.

a. Yes.

2. It acts upon complaints received quite promptly.

3. None.

4. Yes.
a. September, October, February, March.
b. No.
5. Yes.
6. Scarlatina simplex ; no fatality.
a. Yes.
7. Thorough sanitary rules and private funeral generally.
8. None to any extent.
9. Number of cases in October, 1891.
a. One in twelve.
b. Yes.
c. No.
d. Bad in tenement houses, but general improvement noticed over last year.
10. More.
a. Dumb ague variety.
11. Natchaug river.
a. Yes.
12. Empties by natural gravitation into Willimantic river.
13. Our excellent sewer system is being generally extended.
14. Ample and thorough for this township.
15. Good in every way.
16. No.

WOODSTOCK—H. R. LOWE, M.D., Reporter.

1. None.
2. Acts upon complaints received.
4. No.
5. Yes.
6. None.
a. Yes.
7. The body buried at once and no funerals allowed.
8. In March and April very prevalent.
9. None.
b. Yes.
10. Less.
11. By wells mostly.
12. Yes.
13. None.
14. Good.
15. Good.
16. No.

LITCHFIELD COUNTY.

Barkhamsted—J. W. Bidwell, M.D., Reporter.

1. No diseases specially prevalent.
3. None.
4. No.
a. In October, 1891; two cases.
b. No.
5. No.
6. There were a few mild cases last spring.
a. Yes.
7. Do not have public funerals; disinfection is practiced in such cases.
8. Quite a number of cases of mild type.
a. No restrictive precautions.
9. None.
10. They do not occur at all.
11. From wells and springs; good in all seasons.
a. Yes.
12. Generally disposed of with little care for sanitary conditions.
13. None.
14. Poor.
15. Fair for a farming town. Public sentiment appreciates modern sanitary thought and is improving.
16. No.

Falls Village—Canaan—H. E. Carter, M.D., Reporter.

1. An unusual number severe cases of pneunomia.
a. Practically speaking, no.
2. I believe there is a Board of Health, which acts only when compelled to.
4. No.
a. Fall months.
5. I am inclined to think so.
6. None to my knowledge.
a. Yes.
7. Strict.
8. Only a few mild cases.
9. None to my knowledge.

b. Yes.
10. More.
a. Dumb ague variety.
11. Springs, wells and cisterns.
a. Fair.
12. No system.
13. A large spring supplying several houses, formerly left open to cattle and the public, has been bricked up and enclosed.
14. Naturally good, but could be improved upon to a remarkable extent.
15. Indifferent.
16. I have not heard of any, but I presume in case an epidemic assailed us the Board could be resuscitated.

KENT—JOHN W. KING, M.D., Reporter.

1. None.
2. It acts only upon complaints received.
4. No typhoid fever.
5. Yes.
6. No scarlet fever.
a. Yes.
7. All precautions necessary for sanitary purposes.
8. No measles.
9. No diphtheria.
b. Yes.
10. Less.
a. Bilious remittent fever.
11. Reservoir, some wells and springs.
a. Usually; the past season water has been low everywhere.
12. By individuals only.
13. None.
14. Imperfect.
15. Indifferent.
16. No, not to my knowledge.

LITCHFIELD—F. H. WIGGIN, M.D., Reporter.

1. Pertussis and LaGrippe.
2. Acts only upon complaints.
4. No. Two cases.
a. October.
5. Yes.

6. None.

a. Yes.

7. Necessary precautions are observed.

8. A few cases.

a. Yes.

9. Two cases.

a. None.

b. Yes.

c. Foul drains, which for convenience were connected with second story of house.

d. Bad. Peroxide hydrogen used locally with good results.

10. Less.

11. Wells, borough reservoir.

a. Yes.

12. Irrigation.

13. Sewering the two main streets, North and South streets.

15. Good.

16. No.

NEW HARTFORD—JERRY BURWELL, M.D., Reporter.

1. None. Perhaps typhoid fever as much as any.

a. No.

b. In cases of typhoid there is no evidence, as far as your correspondent knows, of epidemic or contagious spread of disease during the last year.

2. Acts in response to complaints.

3. No.

4. No.

a. In October two cases. As many as any month.

b. No.

5. I think not.

6. None.

a. Yes.

7. We have no rules. In fact have had no contagious diseases recently.

8. None.

a. None.

9. Very few cases.

a. I recall no case of death.

b. No.

c. No.

10. Less.

a. Very mild.

11. In this village (North) most of the families are supplied from a running brook through iron pipe.

a. Yes.

12. In the village we have a sewer in the main streets, which empties in the Farmington River.

13. None.

14. Our drainage is naturally good; most of the land is hilly.

15. Good.

16. No.

New Milford—James Hine, M.D., Reporter.

1. La Grippe, whooping cough and infantile diarrhœa.

2. Only upon complaints received.

3. Two cases of stricture of oesophagus of two and three years' standing; removed by dilatation.

4. Not a single case. Has had no standing here for several years.

5. No.

6. None.

a. Yes.

7. Disinfectants about the body and in the room, and limiting attendance as much as possible.

8. None.

9. Two cases.

a. None.

b. Yes.

c. No.

d. Average.

10. Not more than four or five cases.

a. Typho malarial.

11. Village supplied from reservoir in good condition; outside by wells and springs.

a. Yes, usually.

12. Into a small stream which enters into the Housatonic River.

13. None.

14. A good and perfect system of drainage by a connected system of tile drainage in the village. Mostly on the surface in agricultural region.

15. Good.

16. No.

NORFOLK—J. C. KENDALL, M.D., Reporter.

1. After La Grippe last winter the intestinal diseases of children. Cases were all independent of each other.

2. Only on complaint.

3. La Grippe.

4. Have not heard of any typhoid.

5. Can answer only—it is by me.

6. None.

a. Yes.

7. I am happy to believe that there is a growing acquiescence and also active endeavor in the observance of the present advanced sanitary rules as regards care of the dead body, non-public funeral exercises, and disinfection.

8. None.

9. None.

10. Could hardly be less.

a. I have seen but one typical case, a non-resident, remittent in type and yet irregular.

11. Mostly from numerous springs, otherwise from wells ; wells are very rare.

a. Yes.

12. Through natural water-courses or in the old time privy.

13. None.

14. Drainage is all that could be desired. It is that of the natural lay of the ground.

15. For these years all so good, from the sanitary standpoint, as to entirely escape criticism.

16. No.

PLYMOUTH—J. B. HEATH, M.D., Reporter.

1. Pneumonia, "La Grippe," bronchitis, typhoid fever.

a. To some extent.

2. Only upon complaints received.

3. One case of gangrene of lung.

4. It has.

a. October, November, December.

b. Not as I know of.

5. Yes.

6. Have had no cases.

a. I insist upon it.

7. I cannot say.

8. Have had no cases.
a. As in other contagious diséases.
9. Not any.
10. About the same.
11. Springs and wells.
a. Yes.
12. No sewers.
14. Good.
15. Very good.
16. Yes.

ROXBURY—LOUIS J. PONS, M.D., Reporter.

1. Pneumonia, bronchitis, rheumatism.
2. Acts only on complaint.
4. No.
5. Yes.
6. None.
8. A few mild cases.
a. Yes.
9. None.
10. Less.
11. Wells and springs.
a. Yes, generally.
12. Common privy vault.
13. None.
14. A few good tile drains ; mostly surface drainage.
15. Fairly good.
16. No.

SHARON—C. W. BASSETT, M.D., Reporter.

1. "La Grippe."
a. No.
2. It acts only upon complaints received.
4. No. I know of but two cases.
a. These occurred in September and October.
b. No. One of the cases contracted the disease while away from home.
5. Yes.
6. None.
a. Yes.
8. I know of but two families who were visited by measles.

a. It was of mild type and I think few if any precautions were taken.

9. None.

10. Rather less I think.

a. Masked. They take the form mostly of periodic headaches, neuralgias, diarrhœas, etc.

11. The "Sharon Water Co." bring filtered brook water to the village in pipes. The supply outside is from wells.

a. Yes. I think both quantity and quality have been very good all through the year.

12. We have no sewers. Each householder disposes of his own sewage. Common privy vaults are the rule.

13. I know of none.

14. The village being situated on high ground the drainage is very good.

15. Good.

16. Yes.

THOMASTON—RALPH S. GOODWIN, M.D., Reporter.

1. Scarlet fever, whooping cough, measles, cerebro spinal fever.

a. Not entirely.

b. Scarlet fever has not been malignant; most cases were very mild.

2. It acts only upon complaints received. The health officer is instructed to quarantine every case of diphtheria, scarlet fever, and small pox he knows of, without waiting for instructions or to receive complaints.

4. No.

a. We have had only two or three cases and these occurred in the month of October and were mild.

b. They were all traced to an out-of-town source.

5. Yes.

6. We have had about thirty-five cases with only one death. The prevailing type was mild.

a. Yes, in every case.

7. Public funerals are not allowed. Disinfection is done by the undertaker under the direction of the Health Committee.

8. A few scattering mild cases in the spring, with one death from cerebral complications.

a. None.

9. I do not know of any serious case.

a. None.
b. Yes.
10. About the same.
a. Mild and slight and of a remittent type.
11. From an artificial reservoir.
a. No; only in the winter.
12. There is no system of sewage disposal. There are two private sewers which accommodate about twenty families.
13. None.
14. Natural drainage is good.
15. Indifferent.
16. Yes.

TORRINGTON—T. S. HANCHETT, M.D., Reporter.

1. La Grippe early in year, scarlatina, typhoid fever.
a. No.
2. Only upon complaints received.
3. None.
4. Yes.
a. August, September and October.
b. Not to my knowledge.
5. Yes, by some, not by all.
6. Very mild; among small children.
a. Yes.
7. Public funerals are forbidden. Disinfection always advised by the "Regulars."
8. Not any.
9. A few cases. One fatal case of diphtheritic croup.
a. One death only.
b. Yes.
c. No.
d. Bad.
10. Less.
a. Have not seen or heard of a case except it were imported.
11. From Crystal Lake, one and a half miles above, a second reservoir four miles above that, and this fall a third. Water from Whist Pond, of Goshen.
a. Yes; not failed this year, which has been a dry one.
12. Yes; a sewer takes the sewage into the Naugatuck River, east and south of the borough.
13. Drainage of a piece or two of swamp land in the upper part of the borough.

14. Very much improved by the sewers.
15. Good.
16. No.

WARREN—J. B. DERRICKSON, M.D., Reporter.

1. Typhoid fever and scarlet fever. The above diseases were confined to one or two families; cause of scarlet fever unknown.
2. Chiefly the latter.
4. No..
a. March and April.
b. I think to the water.
5. Yes, in my own patients, and I think by other physicians.
6. Five or six cases; grave.
a. As much as possible.
7. Special care is taken not to have the coffins opened, use of disinfectants, etc.
8. Two cases from Colorado.
a. Isolation.
9. None.
10. No malarial cases.
11. Wells and springs.
a. Yes.
12. Buried, generally.
14. I think generally good.
15. Good.
16. No.

WASHINGTON—O. BROWN, M.D., Reporter

1. None.
2. Only upon complaints.
4. No.
b. No.
5. Yes.
6. Only slight sporadic cases.
a. Yes.
7. None.
8. None.
a. None.
9. Few cases of mild type.
a. None.
b. Yes.

c. No.
d. Good.
10. Less.
11. Springs and wells.
a. Yes, but scanty.
12. Mostly surface.
13. None.
14. Good natural drainage.
15. Good.
16. No.

WATERTOWN—WALTER S. MUNGER, M.D., Reporter.

1. Not any except La Grippe. No.
2. I think we have a Board of Health, but do not know that they (or it) ever do anything.
4. Rather more than the immediately previous years.
a. September, and but few cases, mild ; no fatal case.
b. No.
5. Yes.
6. None.
a. So far as we can effect them.
7. According as the physician can or does control.
8. I think none.
9. Very little if any genuine.
a. None.
b. Yes.
c. No.
d. An average.
10. About the same.
a. Nothing marked.
11. Mostly wells.
a. Yes, mostly.
12. According to nature.
13. I suspect none.
14. This is a hilly country and mostly takes care of itself.
15. Pretty good.
16. Not to my knowledge.

WINCHESTER—JOHN W. BIDWELL, M.D., Reporter.

1. None.
2. Makes little note of anything unless complaints are received.

4. No.

6. Almost none, and those few are quite mild cases.

a. Yes.

7. Public funerals are not held, while disinfection is practiced in case of death from contagious diseases.

8. None.

9. No cases of diphtheria during the past year.

10. Less, if anything; scarcely none.

11. From the Lake, mainly, which furnishes pure water.

a. Yes, although there are a few weeks in the spring when the water is less palatable.

12. Is by drainage through tile to a rapid stream which is flushed every week day by the manufactories.

13. Individuals seem more alert and exercise better care as regards their sanitary conditions.

14. Good.

15. Good.

16. No.

WOODBURY—H. W. SHOVE, M.D., Reporter.

1. Influenza and bronchitis in all the seasons of the year.

a. Frequent and extreme changes of temperature. The summer and fall have been hot and dry. Our water supply is deficient, many wells and springs are dry.

2. The Board of Health inspect the school and public buildings and some of the private dwellings. We always inspect where the complaint comes to us.

3. Cases of jaundice or icterus have been numerous during the fall season, with symptoms of gastro-duodenal catarrh continuing eight or ten days.

4. Not more than two or three cases in town.

a. During the year. No special cause known for these.

5. Yes.

6. A few cases of the simple form last spring.

a. Yes.

8. A few mild cases last winter and spring.

9. None.

10. More. Some of the cases have been persistent and prone to recur. The variety is mostly the tertian intermittent.

11. Wells and springs. This present season we are suffering from drought.

a. Usually.
12. On the surface mostly.
14. No system.
15. Fair.
16. No.

MIDDLESEX COUNTY.

Chatham—Albert Field, M.D., Reporter.

1. Catarrhal.
a. I think not wholly.
2. Only on complaints received.
4. No.
a. September and October.
b. I cannot find out.
5. No, not thoroughly.
6. None.
7. There have been no deaths from contagious diseases that have come to my knowledge.
8. Have seen one case and heard of another.
a. In my own case isolation and washing the body with some germicide.
9. None.
10. I think less.
a. If at all as a concomitant of other troubles.
11. Wells mostly.
a. Generally; poorest in the fall, probably because the supply is less.
12. The surface of the earth, as a rule.
13. Few that I have seen or heard of.
14. Such as is found in country places generally; i. e. as it happens.
15. Water supply fairly good. The rest?
16. No.

Chester—S. W. Turner, M.D., Reporter.

1. Some cases of whooping cough, imported from New London; rather severe. Many cases of "Grippe," or influenza, in May and June, followed by great weakness and slow of recovery.

2. Acts upon complaints.

4. No; only two or three cases.

a. In September.

b. Contracted at the cottages on Long Island Sound. Malarial in character. No deaths.

5. Yes.

6. Only one case.

a. Yes.

7. No deaths to report. We should insist on private funerals and strict disinfection.

8. Several cases of measles, also started from New London; rather mild. In one family followed by ring-worm of scalp and face.

9. None.

10. Less.

a. Very rarely marked chills; mostly malarial rheumatism.

11. Wells mostly.

a. Wells low in the fall and the water poor.

12. Surface and running streams. Earth closets more common than heretofore.

13. None.

14. Fair.

15. Good.

16. No.

CROMWELL—J. FRANCIS CALEF, M.D., Reporter.

1. Typhoid fever moderately in early part of year.

a. Yes. Vigorous action on the part of the health committee has stamped it out in most habitats.

2. Health officer has made it a duty to inspect carefully the sanitary condition of every residence and business place where food is sold, at least twice a year. Suggestions as to change, cleansing and disinfection are usually very promptly complied with now. A marked improvement in this every year.

3. What seemed almost an epidemic of perityphlitis in early part of year, chiefly among young men.

4. Not this year.

a. A few cases last month.

b. Spreading from a case treated by an irregular practitioner, notice of which was not sent to this office. When informed of the state of things I found five cases of the disease in the adjoining houses, four of which could be traced to the washing of the

original patient. Two were the washwomen, Swedes, who in succession fell sick of fever about two weeks after washing soiled clothing. The suds was poured upon the soil, which became a nidus.

5. By every regular.

6. Absent during whole year, except one imported light case.

a. Always by regulars.

7. Antiseptic shrouds and sheets, private funerals, complete sulphur fumigation, hot water and sublimate washing of room, burning of bed clothes, an abundance of fresh air.

8. None.

9. Only two cases from which Loeffler bacillus could be cultivated; both recovered.

a. None.

b. Yes.

c. A strong solution of sublimate and potas. permanganate was used on sheets over doors and upon the cotton garments and caps of the nurses. Gargles of weak permang. of potas.

d. About the average.

10. Less.

a. Mild tertian. Inclined to be self-limited to three paroxysms.

11. Wells and cisterns.

a. No, particularly July, August and September.

13. Draining some frog ponds and effort to carry sewage well away from houses before depositing on cultivated land.

15. Rather bad as a whole, but much better than in former years, except water supply.

16. Not printed; by letter and word of mouth.

Durham—Rufus W. Mathewson, M.D., Reporter.

1. None.

2. Complaints.

4. No.

b. Six cases of typhoid in one family. An old lady was confined to the bed, which she defiled, as well as her clothes, which were washed in a room with a loose floor through which the most of the washings ran through to within five feet of the well, out of which the family drank. They refused all disinfectants on account of the smell. The washerwoman was taken first and then the nurse and four children. The nurse died from exposure, having left her room. The others all recovered after protracted sickness.

6*a*. Not always.

8. Only one death; imported from New Jersey.

9. Say fifteen cases; one death.

d. Not good.

10. About the same.

11. Variable.

15. Middling.

16. No.

EAST HADDAM—MATTHEW W. PLUMSTEAD, M.D., Reporter.

1. Malarial.

a. Not removable.

b. Very little pneumonia. No epidemic of any kind.

2. Upon complaints only.

4. No cases.

5. Yes.

6. No cases.

a. Yes.

7. The funeral is private and burial at once. Sealed coffins are used and disinfection.

8. No cases.

9. No cases.

10. Less.

a. Remittent.

11. From wells.

a. Yes.

12. Mostly in closets, which is used on the land.

13. None.

14. The drainage is very good.

15. Good.

16. No.

ESSEX—C. H. HUBBARD, M.D., Reporter.

1. Malarial.

a. To a very limited extent.

2. While there has been no systematic or thorough inspection all complaints have been promptly acted upon, and in several instances the Board has instituted sanitary measures independent of any complaint.

4. A few cases.

a. September and October.

b. No, although careful examinations were made.

5. Yes.

6. Have had none.

7. Thorough disinfection of premises and if deemed necessary, private funeral services.

8. No cases during the year so far as known.

9. None.

10. More.

a. Intermittent fever, neuralgias of a malarial type, many cases of intestinal disorder, and, earlier in the season, respiratory disturbances, intermittent in form and curable only by anteperiodic treatment.

11. Wells, for the most part.

a. Yes, with few exceptions.

12. So far as possible have endeavored to secure discharge of liquid matter into closed cesspools by underground pipes, avoiding surface drainage; burning and burying coarser and solid refuse.

15. Good.

16. No; yet through the columns of local papers have endeavored to urge the importance of sanitary measures, including some specific directions.

HADDAM—MINER C. HAZEN, M.D., and DR. LEROY A. SMITH, Reporters.

1. None excepting Grippe, as below.

2. Acts only upon complaints received, if at all. Have not known of any action by the board the past year.

3. La Grippe.

4. Only a few cases.

a. September and other autumn months.

b. Drinking water generally.

5. I think it may be; it is by me.

6. A few light sporadic cases.

a. Yes.

8. Quite a general prevalence, mild type.

a. None. None advisable in such an epidemic.

9. Only a few sporadic cases. Not of severe type.

b. Generally.

10. Much less.

a. Generally chronic form.
11. Wells, mostly.
a. Yes, except when very dry.
12. Top of ground, mostly.
13. None.
14. Fairly good.
15. Good.
16. Not to my knowledge.

KILLINGWORTH—E. P. NICHOLS, M.D., Reporter.

2. Only upon complaints.
4. No typhoid.
6. None.
8. None.
9. None.
10. Less.
11. Wells.
a. Yes.
16. No.

MIDDLEFIELD—RUFUS W. MATHEWSON, M.D., Reporter.

1. None.
2. Complaints.
3. There were about fifty cases at Rockfall in this town of a contagious porrigo or impetigo mostly in houses with bad sanitary surroundings. The school was closed. Cases thoroughly treated.
4. No; one death. The skin disease began with a small yellow speck which soon enlarged and discharged a yellow substance which formed a honeycomb scab without any surrounding redness; no itching. Scabs when undisturbed left a deep cavity beneath. I applied flax seed poultices and removed the scabs, and have used disinfectant ointments.
5. Not much.
6. None.
8. No measles.
9. Not prevalent.
10. About the same.
a. A second epidemic of grip in the spring.
11. Wells mostly.
16. No.

OLD SAYBROOK—J. H. GRANNISS, M.D., Reporter.

1. Typhoid fever ; ten cases since middle of July.
a. No.
b. Four deaths.
2. Only on complaints.
4. Yes.
a. September.
b. No.
5. Yes.
6. But few cases, mild type.
a. Yes.
7. No special precautions after typhoid. Have had no deaths from other contagious diseases during the year.
8. None.
9. None.
10. Less.
a. More nearly approaching continuous type of fever.
11. Wells.
a. Yes.
12. Each family dispose of sewage as they choose.
13. None.
14. Good in the main.
15. Good.
16. No.

PORTLAND—J. L. GARDNER, M.D., Reporter.

1. La grippe.
a. No.
2. No. A fire ruins have been allowed to stand unremoved on Marlborough street, under which ruins stood stagnant water and filthy deposits. The Board of Health, Selectmen or State Board seemed unable to cause the removal of the nuisance.
3. None.
4. No.
a. Spring.
b. No.
5. Yes.
6. Half a dozen cases, but no deaths.
a. Orders to this effect are given ; not always obeyed.
9. Two cases of malignant type.

a. None.

b. Yes.

c. No.

d. Good.

10. Less.

a. Intermittent and remittent, chills and fever.

11. Reservoir ; good.

a. Yes.

12. Indifferent.

13. Streets improved and some sewerage made.

15. As answered above.

16. No.

SAYBROOK—E. BIDWELL, M.D., Reporter.

1. Catarrhal troubles most prevalent throughout the year.

a. Frequent changes in temperature.

2. Acts on complaint ; also keeps a general lookout for the sanitary condition of the town.

4. More prevalent than for the past few years.

a. Fall months.

b. Such has been suspected in some cases from bad drainage and water supplies.

5. Yes.

6. But few cases, mostly of a mild type.

a. Yes.

7. Strict precautions are observed.

8. A few mild cases.

9. Two malignant cases.

a. One fatal case from diphtheretic laryngitis in a child.

d. Sanitary condition good, excepting a dump heap some forty-three rods from the house.

10. I think less.

11. Mostly from wells.

a. Fair ; some wells fail in very dry seasons.

12. Mostly in dump heaps in the outskirts of the village.

13. Dump heaps removed, filthy places cleared away, and drainage improved.

15. Fair.

16. No.

WESTBROOK—T. B. BLOOMFIELD, M.D., Reporter.

1. La Grippe. One case died, that of a man afflicted with tuberculosis.

2. Only on complaints received.

4. No case in nine years.

5. Always.

6. None.

a. Always.

7. No funerals are public and in every case disinfection is ordered and carried out.

8. None.

9. None.

10. More.

a. Intermittent in type.

11. From wells.

a. So considered. Yes.

12. On surface of the soil.

13. None.

14. None.

15. Indifferent.

16. No.

TOLLAND COUNTY.

ANDOVER (SO. COVENTRY)—WM. L. HIGGINS, M.D., Reporter.

1. None; although there were several cases of pertussis and also of measles during the winter and early spring, some of them of severe type.

b. Health of people has been generally good.

2. Acts only on complaint.

4. One case.

5. It is.

6. None.

a. Yes.

7. There have been no cases of death from contagious diseases, so cannot say.

8. A few cases as above stated.

9. No cases that were certainly diphtheria.

b. Yes.
10. About the same.
11. Wells and springs.
a. Yes.
12. Surface.
13. None.
14. Mostly very good from natural sloping of the land.
15. Good.
16. No.

BOLTON—CHAS. F. SUMNER, M.D., Reporter.

2. Only upon complaints.
4. No cases.
a. Yes.
6. No cases.
7. Private funerals and thorough disinfection.
8. No measles.
9. A few cases.
a. No deaths.
b. Yes.
d. Bad.
10. Much less.
11. Good; from wells.
a. Yes, generally.
12. Ordinary.
13. None.
14. Good.
15. Good.
16. Has not.

COLUMBIA—W. D. WALLER, M.D., Reporter.

1. A few cases of La Grippe of a mild form.

a. Yes, generally from colds and exposure; easily controlled by the use of sudorifics and diuretics.

2. We have taken pains to inspect all places where there has been any disease, also where there was manifest negligence of, or carelessness in regard to sanitary conditions, and have sometimes incurred the displeasure of the ignorant for directing them to clean up, while the better informed have received our advice with courtesy.

4. We have had four cases with one death.

a. November, 1890.

b. Yes, three cases were caused by the use of water from foul wells, the fourth case was contracted while attending school in an adjoining town.

5. Yes, strictly so in all cases.

6. No cases.

a. Yes.

7. Funerals strictly private and thorough disinfection.

8. Confined to two families.

a. The disease was contracted by a member of each family while attending school in an adjoining town, no persons who had not previously had the disease were permitted to visit them.

9. One case, malignant, proved fatal.

b. Yes.

c. The infection is supposed to have been brought in the clothing of a girl who had the disease while visiting in another town.

d. Good.

10. No cases.

11. Wells and natural springs.

a. Generally good.

12. We have no sewage. Excreta and garbage generally utilized for fertilizing purposes.

13. Nothing further than ordinary cleanliness.

14. Natural on the hills, drains and ditches on the low lands.

15. Generally as good as farming towns average.

16. We have not as yet. We now have the matter under consideration.

Coventry—Henry S. Dean, M.D., Reporter.

1. Diseases of the respiratory organs and of the digestive system.

a. Some of them were. Diseases of the respiratory organs were common in the cold weather, including a few cases of pneumonia. In the summer months diseases of the digestive system were of frequent occurrence, especially among children.

2. Mostly upon complaints.

4. No; only a few mild cases.

a. In autumn.

b. No.

5. Yes.

6. A few mild cases.

a. Yes.

7. I am not aware that a death from such diseases has occurred in this town during the last year.

8. In February and March there were a good many cases of measles. No deaths.

a. None very stringent.

9. Some mild cases.

a. No deaths.

b. To some extent.

c. No.

d. Apparently as good as that of other houses.

10. Less.

a. Mild.

11. An aqueduct conveys water from Lake Wangumbaug to the upper part of the village of South Coventry.

12. Natural.

14. Mostly surface.

15. As good as most other towns.

16. It has not.

ELLINGTON—E. T. DAVIS, M.D., Reporter.

1. None except La Grippe.

2. Only upon complaint.

4. No.

6. None.

7. Has been none.

8. Several cases of measles, but mild.

9. None.

10. No more than usual.

11. Mostly from wells.

a. Fair.

12. Cesspools mostly.

13. No special improvement.

14. Very dry soil in a good share of the town.

15. Very good, I think.

16. No.

HEBRON—CYRUS H. PENDLENON, M.D., Reporter.

1. No diseases specially prevalent unless, perhaps, influenza during the winter and spring months and again, to a certain extent, in October.

2. Only as complaints are received, and no complaints have been made during the past year. Most people here in the country would consider it an impertinence to have their premises subjected to systematic sanitary inspections, and inspectors would get more curses than thanks. About everyone feels competent to take care of his own premises without outside help.

4. No.

a. Only two cases, one in April, and one in October.

b. No.

5. Yes, where cases are undoubtedly typhoid.

6. There have been no cases.

a. As far as practicable.

7. No deaths from such diseases during the past year.

8. Moderately severe.

a. None.

9. A very few isolated or sporadic cases, mild.

a. No deaths.

b. As far as practicable.

c. No.

d. Probably about on average with other houses.

10. About the same.

a. Some tertian ague, and perhaps rather more of an irregular character.

11. Wells, mostly.

a. Yes.

12. Thrown upon the surface of the ground.

13. None.

14. Surface drainage.

15. Indifferent.

16. No.

MANSFIELD—F. E. JOHNSON, M.D., Reporter.

1. Dysentery and diarrhœa.

a. Cause unknown, unless the hot, dry weather.

2. On complaints received, I think.

4. Only two cases in North Parish.

a. October.

b. One case, I think, was due to sink spout discharging under the window of kitchen. The other case: could not trace it to any special source.

5. Yes.

6. None.

a. Yes.

8. No cases.

9. No cases in my locality.

10. Very rarely see a case of malaria.

11. Mostly from wells; a few from springs in lead pipe.

a. Yes.

12. Cesspools and on the surface.

13. None that I know of.

14. Good.

15. Good.

16. Not that I can learn.

STAFFORD—C. B. NEWTON, M.D., Reporter.

1. None specially prevalent.

2. Generally upon complaints received.

4. Not as prevalent as usual.

a. September and October.

b. No.

5. Yes.

6. Slight extent, somewhat mild form, no fatal cases.

a. Yes.

7. After recovery or decease repainting, papering, burning clothing, burning sulphur in the closed rooms (?) with the room made damp. At funerals advise keeping the crowd away. Ignorant people evade precautions ordered or advised.

8. Some cases last winter and spring.

a. Isolation advised, but generally ignored.

9. Few cases during the year; none fatal, I believe.

a. Yes.

b. Poor.

10. Less.

a. New editions of old cases when it has appeared this year.

11. From reservoir. Water from barren region.

a. Good; yes.

12. On principal streets sewers running into swift water, rocky bottom.

13. More sewers.

14. Good; have sharp grades.

15. Good at Stafford Springs; in other parts of the town as formerly.

16. No.

TOLLAND—W. M. SIMMONS, M.D., Reporter.

1. La Grippe and pneumonia during winter and spring.

a. Generally.

b. None.

2. Acts only upon complaints received.

3. La Grippe, if it can be called rare now.

4. No cases that I know of.

a. Usually the autumn months.

b. None to trace.

5. Yes.

6. No cases.

a. Yes.

7. There has been no deaths from contagious diseases here; if there had been the funerals would be private, allowing only necessary persons to bury the dead, and all the precautions taken to prevent its spread.

8. No cases.

a. None.

9. No cases.

a. None.

b. Yes.

c. No cases to report.

d. None infected.

10. Less prevalent.

a. Chills and fever.

11. "Tolland Street" is mostly supplied by aqueduct water, with some dug wells; the rest of the town has dug wells.

a. Yes.

12. Some tile drains; mostly surface.

13. None that I am aware of.

14. Mostly surface drainage.

15. Good.

16. No.

UNION—WM. RICHARDSON, M.D., Reporter.

1. None.
2. Only upon complaints received.
3. None.
4. No.
a. August; one case only.
b. No.
5. Advised, but not insisted upon.
6. No cases.
7. Immediate burial. Thorough disinfection of premises.
8. No cases.
9. A few cases, both mild and malignant.
a. About one-half.
b. Yes.
d. Same as good as the average of old farm houses. Others very filthy.
10. None at all.
11. Wells and springs.
a. Yes.
b. I think so.
12. As is usual in rural places.
13. None..
15. Good, I should say.
16. Think not.

VERNON—A. R. GOODRICH, M.D., Reporter.

1. Measles prevailed as an epidemic during the winter months, so much so that several schools were discontinued for some weeks. No deaths reported; generally of mild character. The Board of Health have no stated time of meeting, and only act when called upon.

3. A number of singular cases are reported by physicians in their practice in town, when the patient would be taken with nausea followed by vomiting, and soon the whole surface of the body would become intensely yellow, and fever following, which continued for a few days, and then all symptoms would yield to treatment; evidently of a hepatic character.

4. Typhoid fever has been less prevalent than in former years. Only three deaths reported during the year. Several cases have been reported as such, making good recoveries in about two

weeks, could not come under the head of typhoid fever, as the lesions attending the fever were absent. Most of the cases occurred in tenement houses where drainage and privy vaults were near the surface.

5. Disinfection of excreta of all patients of this character insisted upon.

6. Scarlet fever has been less prevalent than in former years, and no deaths reported. All cases of a mild character.

a. Isolation and disinfection ordered.

7. In all cases of death from any malignant or contagious disease, private funerals observed.

8. As above reported an extensive epidemic of measles prevailed during the winter months, all of a mild character and requiring but little medical treatment. All restrictive precautions used. No deaths.

9. Diphtheria has been less than in 1890, and most cases of a mild character; only two deaths reported.

b. Disinfectants freely used.

10. Less than in many years previous.

11. The water supply of the town is from wells and of good quality; that for the city of Rockville is from Snipsic Lake and of better quality than that supplied to most of the cities and towns of the states having its source from the granite hills of Tolland County. The increase in population calls for an increase of water, which, in the near future, will be abundant for all. Families living above the source of supply from the lake are dependent upon wells, but the building of a reservoir (which is contemplated) will give all an abundant supply from the lake.

The sanitary condition of the new town house is most excellent. Water has been conducted to the house the distance of a mile through a six inch pipe, with a fall of over 90 feet, giving the inmates an abundant supply of water for bathing, culinary and fire purposes, also a sewage pipe of over 1,000 feet, leading from the house.

The completion of this building with its water supply, etc., costing over $15,000, is a credit to the town and a step in the right direction, and will be worthy of imitation to any city or town in the State.

12. The sewage question is one for the future to determine, and its pressing need will force itself upon our city government to decide between underground or surface sewage disposal as

now mostly in use. Where and how to dispose of it is the great question. It certainly will not do to conduct it into the already overloaded stream which passes through the city, to settle and fill up the ponds in the midst of a dense population, but should be conducted by a system of sewerage outside the city limits.

The Town of Vernon recently voted to build a $50,000 high school building in Rockville with a seating capacity of two hundred, and the building committee have the question of heating, ventilation, and sewerage to solve; the first two are easily disposed of, but that of sewerage is of vital importance to the scholars as well as the public. Situated as the building will be, the sewage could not be conducted into the public sewer, to be deposited in the stream against the protest of mill owners, and the public in general, consequently the committee have decided to put in, in connection with the heating apparatus a crematory, thus disposing of all excrementitions produced by burning after thoroughly drying. This system is new, and in a sanitary point of view, in connection with ventilation is a step in advance of all other systems now in use. Messrs. Fuller & Mason, of Boston, have taken the contract for the construction of the crematory.

13. No sanitary regulations have been issued by the Board of Health.

14. Drainage indifferent. Wholly surface except in Rockville to a limited extent, which is disposed in the stream which is now already overloaded.

Willington—F. E. Johnson, M.D., Reporter.

1. During the months of August and September, several cases diarrhœa.

a. Hot, dry weather and poor drainage.

2. Only on complaints received.

4. Only one case in October.

b. No.

5. Yes.

6. No cases.

a. Yes.

8. None.

9. No cases.

10. No cases.

11. Mostly from wells. From springs, in iron and lead pipe, in the village of South Willington.

a. Yes, very good.

12. Upon the surface of the ground, cesspools, or onto compost heaps. The village, or a part of it (South Willington), into an open ditch, washed out often.

13. None that I know of.

14. Very good.

15. Very good.

16. I think not.

A Brief Review of the Replies of our Correspondents.

Of the 168 towns of Connecticut we have reports from 129 through special sanitary correspondents.

It is to be regretted that we have not a report from every town in the State. At the same time it is a matter deserving the thanks of all who are interested in the sanitary condition of the State, that so many busy practitioners have gratuitously contributed the valuable information which their reports contain. The towns from which no report has been received are as follows: In Hartford County, Bloomfield, Burlington, Canton, East Hartford, Hartland, Marlborough, Simsbury and West Hartford, eight in number, with a population of only 14,516.

In New Haven County, five towns, viz: Ansonia, Bethany, East Haven, North Haven and Wolcott, with a population of 14,231.

In New London County, five towns, East Lyme, Lebanon, Ledyard, Montville and Waterford, with a population of 9,906.

In Fairfield County, five towns, Easton, Huntington, New Fairfield, Newtown and Sherman, with a population of 9,884.

In Windham County, three towns, Ashford, Putnam and Sterling, with a population of 8,341.

In Litchfield County, nine towns, Bethlehem, Bridgewater, Colebrook, Cornwall, Goshen, Harwinton, Morris, North Canaan and Salisbury, with a population of 11,143.

In Middlesex County, two towns, viz: Middletown, the only one containing a city, which has not reported, and Clinton, with a total population of 16,539.

In Tolland County, Somers is the only town which failed to report. Its population is 1,407.

With the exception of Ansonia and Middletown, all the towns from which we have no report are quite small, so that the responses to the interrogatories represent practically the sanitary condition of the whole State.

	90	per cent.	of the	population	of	Hartford	County	has	reported.
	94	"	"	"	"	New Haven	"	"	"
	87	"	"	"	"	New London	"	"	"
	94	"	"	"	"	Fairfield	"	"	"
	82	"	"	"	"	Windham	"	"	"
	80	"	"	"	"	Litchfield	"	"	"
	58	"	"	"	"	Middlesex	"	"	"
	95	"	"	"	"	Tolland	"	"	"
And	88	"	"	"	"	the whole State		"	"

Briefly summarizing the answers to some of the more important questions we find the following results :

There has been no excessive prevalence of any disease ; that is, no notable epidemic in the State, during the year. There have been outbreaks of limited extent and duration, in several places, of typhoid fever, scarlet fever, diphtheria and diseases that are endemic. Epidemic influenza was quite moderately present in many parts of the State during the latter part of the winter and early spring. But the epidemic of it which has since prevailed so universally among our people had barely begun at the close of the year, which our report covers, that is at Nov. 30th.

Let us consider more at length the answers to some of our questions.

Sanitary Inspections.

"Does your Board of Health make sanitary inspections systematically, or does it act only upon complaints received?" The responses to this question reveal the low standard of official duty which satisfies those who assume the responsibilities of being guardians of the public health.

Of the 129 towns heard from, 106 report that the Board of Health does not feel it a duty to act in any case until a nuisance becomes so intolerable that it is complained of. Now, as such complaints often affect very seriously the pleasant relations of neighbors and engender hostile feelings which had not before existed, the damage to the moral health of the community may

be a greater evil than the offending nuisance would have been to the physical health.

Prosperous farmers do not wait until a crop is ruined by invasion of cattle through a broken fence, before repairing it. Well managed railroads do not neglect the condition of their tracks and bridges until a disastrous wreck impresses the necessity of repair.

All prosperous pursuits and successful undertakings are so, because the dangers which threaten them are carefully foreseen and avoided. But the appointed guardians of the public health in 106 towns out of 129 openly confess that they give no attention to the causes of disease until they have produced their consequences, and not till then do they try to remove them. There is an old adage, which relates to locking the stable door after the horse was stolen, which would seem to have an application here.

Typhoid Fever.

The enquiries about typhoid fever show that it has prevailed to about the same extent as in former years, taking the State as a whole. There have been localities in which there was more of it in the year and others in which there was less.

Until some more radical and general effort is made to protect water supplies it is not to be expected that there will be much abatement in the frequency of typhoid fever cases.

In 24 towns the correspondents say there have been no cases through the year.

In 82 towns it is reported as not unusually prevalent.

In 23 towns it is reported as having been more prevalent.

Disinfection.

The questions relating to disinfection do not bring very satisfactory answers.

Although a very large majority of the correspondents assert that disinfection is practiced in all cases of contagious diseases, yet the assertion is made in a way to convey the idea that the real work of disinfection is left almost wholly to the members of the family to perform, as best they can, in the absence of any personal direction and oversight by an official or competent person.

In no case does any correspondent describe in detail the agents for disinfection which are employed or the methods of application.

The probability is that in very many cases those in authority consider their duty done when they have told the members of the family what to get for disinfectants and given some verbal directions about using them.

This inference is based in part upon what our correspondents have written, and in part upon the personal observation and enquiries of the Secretary in his visits to various parts of the State where local epidemics were existing. And the inference is further sustained by the frequency of failure to prevent the spread of contagious diseases, which could not be if disinfection was thorough and complete.

It is not yet generally understood that it is one of the most important functions of local Boards of Health to *know* by positive sources of information that in every case of contagious disease, a judicious degree of isolation is observed, and that disinfection is performed in a practical and thorough manner, particularly after the convalescence and recovery or the death of the patient, and when the services of the physician are no longer required.

To this end every town board should have at call some person, instructed in the methods and means of disinfection, who should be employed to disinfect apartments and houses, wherever infectious diseases have occurred.

If disinfection is neglected, all other means of controlling the spread of infectious diseases will fail.

The State Board of Health keep constantly on hand printed circulars giving very full and clear directions respecting the means and methods of disinfection, which may always be had upon application to the Secretary.

Diphtheria.

Diphtheria would appear to have maintained about its usual prevalence during the year, with varying amount in different towns.

Such may be expected to be the future report about it, for an indefinite time, until local boards of health can be brought to appreciate their responsibilities, in preventing its spread.

The answers of correspondents to the questions relating to the origin and spread of this disease and the sanitary condition of the houses in which it has occurred are very interesting, as confirmatory of the growing belief that the disease is spread only by contagion, and that it does not originate in drains and cesspools and foul places. Although such places may afford conditions for the prolonged vitality or the reproduction even of the disease germ once implanted in them.

Only a portion of the sanitary correspondents have answered these questions.

As causes of the disease some have given the following: Filthy henroost, sink drains, over-crowded tenement house, cesspool, open drain in cellar and foul drains. In no instance, however, have they given any detailed facts to prove that such was the primary cause or that they were other than predisposing conditions favoring the susceptibility of subjects to the infection.

On the other hand, the well known and innumerable instances of its transmission by fomites and of its direct contagion from patients is very satisfying evidence that the infectious principle is specific and generated in the patient.

In this connection the testimony of our correspondents in regard to the sanitary condition of the houses in which diphtheria has occurred is important.

Of those who have replied to this question, 21 state that the sanitary condition was good, 24 that it was bad, and 14 that it was as good as the average. Are not such facts strong in support of the belief that diphtheria spreads by a specific cause and is very independent of external conditions?

Malarial Diseases.

As regards the prevalence of malarial diseases, the testimony of our correspondents is that they are disappearing.

To the question, "Have they prevailed more than in 1890, or less?" nine answer that there has been none in their towns, 23 that it was about the same, 75 that it was less than in the year before, and 19 towns say they have had more of it.

Water Supply and Sewage Disposal.

As to the water supply, our correspondents report over 40 towns in which there is a public supply, of which a greater or less proportion of the inhabitants partake.

The other towns of the State depend, of course, as heretofore, upon wells and springs and in a few cases upon cisterns.

The reports from correspondents indicate a growing improvement in the methods of sewage disposal, and the adoption in an increasing number of towns of some system of sewering.

Reviewing as a whole the general character of the information contributed from the various parts of the State on the subjects enquired about, and comparing it with similar reports of past years, there is a very marked and important progress apparent both in the appreciation of the importance of public hygiene as a factor in public prosperity and in the intelligent observation of sanitary laws.

OFFICERS OF THE LOCAL BOARDS OF HEALTH IN THE TOWNS, CITIES AND BOROUGHS OF CONNECTICUT.

[Arranged in alphabetical order irrespective of counties.]

The officers of the Town Boards of Health herein named were elected in October, 1891, to hold office one year.

The health officers of the cities and boroughs are elected in accordance with their respective charters.

ANDOVER.

President, W. A. Brown; *Health Officer*, E. H. Cook; *Clerk*, F. A. Sackett.

ANSONIA.

President, E. W. Webster; *Health Officer*, J. A. Fisk; *Clerk*, R. H. Tucker.

ASHFORD.

President, L. E. Stowell; *Health Officer*, Wm. Richardson; *Clerk*, Nelson Hammond.

AVON.

President, E. F. Miller; *Health Officer*, R. W. E. Alcott, M.D.; *Clerk*, S. D. Alford.

BARKHAMSTED.

President, W. D. Youngs; *Health Officer*, H. D. Moore, M.D.; *Clerk*, E. A. Rogers.

BEACON FALLS.

President, G. G. Clark; *Health Officer*, O. D. Buckingham; *Clerk*. O. D. Buckingham.

BERLIN.

President, N. F. Taylor; *Health Officer*, R. E. Ensign, M.D.; *Clerk*, R. E. Ensign, M.D.

BETHANY.

President, Ernest Hotchkiss; *Health Officer*, S. G. Davidson; *Clerk*, S. G. Davidson.

BETHEL.

President, A. S. Judd; *Health Officer*, A. E. Barber, M.D.; *Clerk*, H. A. Gilbert.

BOROUGH OF BETHEL.

Warden and Burgesses.

BETHLEHEM.

President, ——; *Health Officer*, W. R. Harrison; *Clerk*, G. W. Percy.

BLOOMFIELD.

President, W. J. Gabb; *Health Committee*, L. J. Filley, G. F. Hubbard, J. W. Spencer; *Clerk*, H. Gray, M.D.

BOLTON.

President, J. L. White; *Health Committee*, C. F. Sumner, M.D., N. S. Maine; *Clerk*, N. S. Maine.

BOZRAH.

President, Simeon Abel; *Health Officer*, S. G. Johnson, M.D.; *Clerk*, Simeon Abel.

BRANFORD.

President, M. Riel; *Health Committee*, C. W. Gaylord, M.D., W. H. Zink, M.D.; *Clerk*, C. W. Gaylord, M.D.

BRIDGEPORT—CITY AND TOWN.

President, C. E. Sanford, M.D.; *Health Officer*, R. Fitz Gibbon; *Clerk*, F. C. Mullins.

BRIDGEWATER.

President, A. H. Gillett; *Health Officer*, D. H. Canfield; *Clerk*, Amos Northrop.

BRISTOL.

President, Wm. Linstead; *Health Committee*, G. S. Hull, M.D., Jno. Winslow, S. D. Bull; *Clerk*, J. J. Jennings.

BROOKFIELD.

President, Benj. Griffin; *Health Committee*, J. F. Smith, M.D., D. H. Meeker, W. F. Wildman; *Clerk*, E. H. Northrop.

BROOKLYN.

President, J. B. Stetson; *Health Committee*, W. R. Thurbur, F. A. Prince, Amos Kendall; *Clerk*, J. M. Coburn, M.D.

BURLINGTON.

President, C. B. Hotchkiss; *Health Committee*, M. Lyons, J. B. Smith, Wm. Elton, M.D.; *Clerk*, J. A. Reeve.

CANAAN.

President, Stephen Brigner; *Health Committee*, S. Brigner, Jas. Hakes, W. I. Kellogg, W. J. Lord; *Clerk*, W. J. Lord.

CANTERBURY.

President, C. C. Frink; *Health Officer*, N. J. Lyon; *Clerk*, M. H. Sanger.

CANTON.

President, G. P. Edwards; *Health Committee*, G. F. Lewis, M.D., J. B. Lougee, F. A. Alderman, W. J. Soudant, B. O. Higby, B. F. Case; *Clerk*, W. W. Bidwell.

CHAPLIN.

President, J. L. Eaton; *Health Officer*, O. Witter, M.D.; *Clerk*, F. C. Lummis.

CHATHAM.

President, H. E. Carpenter; *Health Committee*, F. D. Strong, H. E. Carpenter, W. B. Tibbals; *Clerk*, F. D. Strong.

CHESHIRE.

President, H. H. Fields; *Health Committee*, C. S. Spaulding, E. T. Cornwall, M.D., M. N. Chamberlain, M.D.; *Clerk*, M. N. Chamberlain, M.D.

CHESTER.

President, S. A. Wright; *Health Committee*, F. S. Smith, M.D., J. T. Smith, L. R. Bishop; *Clerk*, J. T. Smith.

CLINTON.

President, E. W. Wellman; *Health Officer*, H. S. Reynolds, M.D.; *Clerk*, S. S. Wilcox.

COLCHESTER.

President, E. L. Strong; *Health Officer*, M. W. Robinson, M.D.; *Clerk*, E. S. Day.

COLEBROOK.

President, W. H. Vining; *Health Committee*, W. H. Vining, S. A. Cooper; *Clerk*, S. A. Cooper.

COLUMBIA.

President, W. D. Waller, M.D.; *Health Officer*, W. D. Waller, M.D.; *Clerk*, W. A. Collins.

CORNWALL.

President, D. L. Smith; *Health Committee*, D. L. Smith, L. J. Nickerson, W. W. Bierce; *Clerk*, L. J. Nickerson.

COVENTRY.

President, W. L. Higgins, M.D.; *Health Committee*, H. S. Dean, M.D., W. P. Haven, M.D., W. L. Higgins, M.D.; *Clerk*, J. B. Carman.

CROMWELL.

President, J. A. Duncan; *Health Officer*, J. F. Calef, M.D.; *Clerk*, W. G. Root.

CITY OF DANBURY.

Health Committee, appointed by Common Council.

DANBURY.

President, Henry Bernd; *Health Officer*, E. A. Stratton, M.D.; *Clerk*, Geo. Wakeman.

BOROUGH OF DANIELSONVILLE.

Warden and Burgesses.

DARIEN.

President, J. C. Klinefetter; *Health Officer*, W. F. French, M.D.; *Clerk*, W. F. French, M.D.

DERBY.

President, C. S. Chaffee : *Health Committee*, M. E. Treat, J. Dockery, G. L. Beardsley, M.D., L. L. Loomis ; *Clerk*, D. E. McMahon.

DURHAM.

President, G. W. Newton ; *Health Officer*, Jno. Marshall ; *Clerk*, C. C. Atwell.

EASTFORD.

President, M. F. Latham ; *Health Officer*, E. K. Robbins, M.D.; *Clerk*, J. M. Keith.

EASTON.

President, E. Gould ; *Health Officer*, C. C. Sherman ; *Clerk*, Wm. Wakeman.

EAST GRANBY.

President, W. E. Northway ; *Health Officer*, W. A. Foster ; *Clerk*, A. C. Bates.

EAST HADDAM.

President, A. E. Purple ; *Health Committee*, M. W. Plumstead, M.D., M. H. Watrous, G. B. Lewis. N. W. Rathbun, S. R. Holmes ; *Clerk*, M. H. Watrous.

EAST HARTFORD.

President, H. L. Goodwin ; *Health Officer*, E. J. McKnight, M.D.; *Clerk*, E. O. Goodwin.

EAST HAVEN.

President, S. W. F. Andrews ; *Health Committee*, R. H. Coe, J. S. Tyler, D. W. Tuttle, C. T. Hemingway, C. C. Kirkham, R. S. Thompson, H. Woods ; *Clerk*, G. J. Tuttle.

EAST LYME.

President, E. M. Comstock ; *Health Committee*, F. L. Dart, M.D., Daniel Calkins, M.D.; *Clerk*, Daniel Calkins, M.D.

EAST WINDSOR.

President, A. R. Hamilton ; *Health Committee*, E. M. Granger, G. A. Ellis, H. N. Allen, C. T. Inslee, H. E. Rowley, H. O. Allen, M.D.; *Clerk*, H. O. Allen, M.D.

ELLINGTON.

President, R. J. Leonard ; *Health Officer*, E. T. Davis, M.D.; *Clerk*, F. M. Charter.

ENFIELD.

President, L. H. Pease, M.D.; *Health Officer*, C. F. Morrison ; *Clerk*, F. E. Ely.

ESSEX.

President, E. W. Dolph ; *Health Officer*, C. H. Hubbard, M.D.; *Clerk*, T. D. Coulter.

FAIRFIELD.

President, B. B. Brothwell; *Health Committee*, B. B. Brothwell, J. A. Osborn, M.D.; *Clerk*, F. L. Sherwood.

FARMINGTON.

President, E. Gay; *Health Committee*, N. O. Keyes, H. B. Barbour, E. M. Ripley, M.D., G. E. Taft; *Clerk*, T. L. Porter.

FRANKLIN.

President, P. O. Smith; *Health Officer*, P. O. Smith; *Clerk*, S. G. Hartshorn.

GLASTONBURY.

President, T. H. L. Tallcott; *Health Officer*, H. C. Bunce, M.D.; *Clerk*, W. S. Goslee.

GOSHEN.

President, Lyman Hall; *Health Officer*, J. H. North, M.D.; *Clerk*, J. H. North, M.D.

GRANBY.

President, S. F. Holcomb; *Health Officer*, W. G. Murphy, M.D.; *Clerk*, W. G. Murphy, M.D.

GREENWICH.

President, G. W. Brush; *Health Officer*, W. L. Griswold, M.D.; *Clerk*, A. M. Brush.

BOROUGH OF GREENWICH.

Warden and Burgesses.

GRISWOLD.

President, Wm. Soule, M.D.; *Health Committee*, Wm. Soule, M.D., G. H. Jennings, M.D., W. P. Young, S. H. Holmes, M.D.; *Clerk*, G. H. Jennings, M.D.

GROTON.

President, Albert Stanton; *Health Committee*, L. M. Guernsey, J. A. Morgan, J. L. Weaver; *Clerk*, N. S. Fish.

GUILFORD.

President, J. A. Dudley; *Health Committee*, G. H. Beebe, M.D., E. W. Bartlett, Hart Landon; *Clerk*, C. H. Post.

HADDAM.

President, O. C. Neff; *Health Officer*, Leroy A. Smith, M.D.; *Clerk*, Leroy A. Smith, M.D.

HAMDEN.

President, J. T. Henry; *Health Committee*, W. M. Cook, D. C. Sanderson, Geo. Joslyn, M.D.; *Clerk*, E. B. Cooper.

HAMPTON.

President, A. J. Greenslit; *Health Committee*, H. H. Converse, M.D., A. J. Greenslit, W. H. Burnham, J. F. Hyde; *Clerk*, W. H. Burnham.

HARTFORD.—CITY AND TOWN.

President, James Campbell, M.D.; *Health Officer*, P. J. Darcy; *Clerk*, W. W. Knight, M.D.

HARTLAND.

President, I. D. Emmons; *Health Officer*, F. C. Committie; *Clerk*, J. A. Miller.

HARWINTON.

President, Willis Catlin; *Health Committee*, S. B. Barber, J. M. Baldwin, C. S. Birge; *Clerk*, N. A. Wilson.

HEBRON.

President, C. H. Pendleton, M. D.; *Health Committee*, C. H. Pendleton, M.D., H. F. Porter, F. R. Post; *Clerk*, F. C. Bissell.

HUNTINGTON.

President, S. T. Palmer; *Health Committee*, G. A. Shelton, M.D., Chas. Beard, S. B. Brownson, G. M. Wakeley; *Clerk*, J. Tomlinson; *Sanitary Inspector*, Gideon Tomlinson.

KENT.

President, Luther Eaton; *Health Officer*, B. G. Pratt; *Clerk*, J. F. Gibbs.

KILLINGLY.

President, E. A. Hill, M.D.; *Health Committee*, E. A. Hill, M.D., W. H. Judson, M.D., A. E. Darling, M.D.; *Clerk*, E. L. Palmer.

KILLINGWORTH.

President, W. E. Griswold; *Health Officer*, D. K. Stevens; *Clerk*, D. K. Stevens.

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President, G. A. Mills; *Health Committee*, E. L. Danielson, M.D., G. A. Mills, C. H. Loomis, C. B. Noyes. W. P. Barber, M.D.; *Clerk*, N. C. Barker.

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President, G. G. Young; *Health Officer*, F. E. Robinson; *Clerk*, F. E. Robinson.

LITCHFIELD.

President, Chas. Merriman; *Health Officer*, C. O. Belden, M.D.; *Clerk*, A. D. Catlin.

BOROUGH OF LITCHFIELD.

Burgesses.

LYME.

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President, Geo. Hall; *Health Committee,* F. H. Whiton, M.D., T. H. Weldon, M.D., B. F. T. Jenney, J. H. DeVore; *Clerk,* B. F. T. Jenney.

MANSFIELD.

President, E. G. Sumner, M.D; *Health Committee,* E. G. Sumner, M.D., G. W. More; *Clerk,* G. W. More.

MARLBOROUGH.

President, A. B. Latham; *Health Committee,* Chas. Buell, R. B. Lord; *Clerk,* John Lord.

CITY OF MERIDEN.

Committee appointed by Common Council.

MERIDEN.

President, ——; *Health Committee,* LeGrand Bevins, W. E. Miller, D. J. Lyon; *Clerk,* ——.

MIDDLEBURY.

President, G. B. Bristol; *Health Officer,* Marcus DeForest, M.D.; *Clerk,* Marcus DeForest, M.D.

MIDDLEFIELD.

President, J. C. Safford; *Health Committee,* G. W. Durkee, J. T. Inglis, V. H. Coles, D. S. Coe; *Clerk,* W. S. Hall.

CITY OF MIDDLETOWN.

Health Committee, appointed by Common Council.

MIDDLETOWN.

President, C. R. Woodward; *Health Committee,* C. R. Woodward, R. Davis, M. H. Johnson, M. Loveland, G. T. Meech, C. G. Bacon, W. U. Pearne, D. J. Donahoe; *Clerk,* R. S. Hayes.

MILFORD.

President, I. C. Smith; *Health Committee,* J. W. Beach, E. B. Heady, M.D., Jas. McCarthy; *Clerk,* Jas. McCarthy.

MONROE.

President, W. R. Ferris; *Health Committee,* W. R. Ferris, Burr Hawley, J. G. Stevens, M.D.; *Clerk,* C. E. Osborne.

MONTVILLE.

President, O. W. Douglass; *Health Committee,* E. Mathewson, M.D., W. M. Burchard, M.D.; *Clerk,* J. R. Gay.

MORRIS.

President, R. H. Harrison; *Health Officer*, P. B. Randall; *Clerk*, J. M. Benton.

NAUGATUCK.

President, G. D. Bissell; *Health Committee*, N. S. Wilmot, A. Knapp, S. N. Andrew, H. A. Hasck; *Clerk*, M. H. Lawlaus.

CITY OF NEW BRITAIN.

Committee appointed by Common Council.

NEW BRITAIN TOWN.

President, Sam'l Bassett; *Health Committee*, W. P. Bunnell, M.D., C. S. Andrews, Jas. Roche; *Clerk*, Albert Morton.

NEW CANAAN.

President, S. H. Raymond; *Health Officer*, W. C. Brownson, M.D.; *Clerk*, F. M. Bliss.

NEW FAIRFIELD.

President, ———; *Health Officer*, J. F. Smith, M.D., appointed by State Board; *Clerk*, ———.

NEW HARTFORD.

President, H. R. Jones; *Health Committee*, J. Burwell, M.D., E. D. Curtis, M.D., J. Swett, M.D., L. O. H. Caya, M.D.; *Clerk*, F. A. Jewell.

NEWINGTON.

President, J. S. Kirkham; *Health Officer*, L. V. Durand, M.D.; *Clerk*, J. H. Fish.

NEW LONDON, CITY.

Health Committee, Benj. H. Lee, Jno. Moran, Geo. M. Cole.

NEW HAVEN, CITY AND TOWN.

President, A. E. Winchell, M.D.; *Health Officer*, F. W. Wright, M.D.; *Clerk*, Ward Bailey; *Sanitary Inspectors*, J. C. Jackson, Lewis Mix, Martin Conlan.

NEW MILFORD.

President, I. B. Bristol; *Health Committee*, I. F. Northrop, J. W. McMahon, J. C. Barker, M.D.; *Clerk*, Alex. Levy.

NEWTOWN.

President, C. W. Dayton; *Health Officer*, D. P. Richardson, M.D.; *Clerk*, M. J. Houlihan.

NORFOLK.

President, M. F. Grant; *Health Officer*, J. C. Kendall, M.D.; *Clerk*, R. J. Crissey.

NORTH BRANFORD.

President, H. O. Page; *Health Committee*, M. C. Bishop, Edw. Smith; *Clerk*, Edw. Smith.

NORTH CANAAN.

President, D. L. Freeman; *Health Officer*, J. H. Drake; *Clerk*, J. B. Hardenbergh.

NORTH HAVEN.

President, Whitney Elliott; *Health Officer*, R. B. Goodyear, M.D.; *Clerk*, L. P. Tuttle.

NORTH STONINGTON.

President, C. H. Stewart; *Health Officer*, E. H. Knowles, M.D.; *Clerk*, N. A. Brown.

NORWALK.

President, Sam'l Daskam; *Health Committee*, J. G. Gregory, M.D., F. B. Baker, M.D., Russell Frost, Sam'l Daskam, C. B. Coolidge; *Clerk*, C. B. Coolidge.

NORWICH.

President, P. Cassidy, M.D.; *Health Committee*, P. Cassidy, M.D., W. Witter, M.D., H. M. Bishop, M.D., F. A. Tillinghast, M.D., N. P. Smith, M.D., L. S. Paddock, M.D., J. Eccles, J. S. Lathrop, W. T. Case; *Clerk*, L. S. Paddock, M.D.

CITY OF NORWICH.

Health Committee, Court of Common Council.

OLD LYME.

President, J. G. Perkins; *Health Officer*, G. W. Harris, M.D.; *Clerk*, J. M. Terry, M.D.

OLD SAYBROOK.

President, ——; *Health Officer*, J. H. Granniss, M.D., appointed by State Board; *Clerk*, ——.

ORANGE.

President, C. F. Smith; *Health Officer*, J. F. Barnett, M.D.; *Clerk*, G. W. Adams.

OXFORD.

President, R. B. Limburner; *Health Officer*, Lewis Barnes, M.D.; *Clerk*, E. B. Treat.

PLAINFIELD.

President, Frank Miller; *Health Committee*, Frank Miller, W. I. Hyde, B. R. Briggs; *Clerk*, W. I. Hyde.

PLAINVILLE.

President, C. S. Hough; *Health Officer*, J. N. Bull, M.D.; *Clerk*, J. N. Bull, M.D.

PLYMOUTH.

President, E. M. Talmadge; *Health Committee*, E. M. Talmadge, Byron Tuttle, W. P. Swett, M.D., W. G. Barton, A. M. Johnson; *Clerk*, W. G. Barton.

Pomfret.

President, ——— ; *Health Committee*, F. G. Sawtelle, M.D., F. Chapin, M.D., A. S. Bruce, T. O. Elliott, H. Sabin ; *Clerk*, A. G. Williams.

Portland.

President, ——— ; *Health Officer*, R. M. Griswold, M.D., appointed by State Board ; *Clerk*, ———.

Preston.

President, C. B. Chapman ; *Health Officer*, C. N. Gallup, M.D.; *Clerk*, F. W. Tracy.

Prospect.

President, D. B. Hotchkiss ; *Health Officer*, J. R. Platt ; *Clerk*, D. M. Plumb.

Putnam.

President, C. D. Torey ; *Health Committee*, J. B. Kent, M.D., A. H. Corben, C. H. Cheesbro ; *Clerk*, O. Coman.

Redding.

President, Henry Whitehead ; *Health Committee*, E. H. Smith, M.D., R. W. Lowe, M.D.; *Clerk*, J. N. Nickerson.

Ridgefield.

President, R. W. Keeler ; *Health Committee*, W. S. Todd, M.D., H. Smith, D. S. Sholes ; *Clerk*, H. K. Scott.

Rocky Hill.

President, W. G. Robbins; *Health Committee*, Jas. Deasy, J. S. Stevens, J. W. Camp ; *Clerk*, F. L. Burr, M.D.

Roxbury.

President, B. S. Preston ; *Health Officer*, L. J. Pons, M.D.; *Clerk*, G. W. Lendeveg.

City of Rockville.

Health Committee, M. Doane, J. McPherson, J. B. Prado, F. L. Dickinson, M.D.

Salem.

President, H. E. Avery ; *Health Officer*, C. F. Congdon, M.D.; *Clerk*, C. F. Congdon, M.D.

Salisbury.

President, A. J. Spurr ; *Health Officer*, H. M. Burtch, M.D.; *Clerk*, P. Turner.

Saybrook.

President, J. W. Marvin ; *Health Officer*, E. Bidwell, M.D.; *Clerk*, E. C. Southworth.

SCOTLAND.

President, O. S. Remington ; *Health Officer*, J. C. Taylor, M.D.; *Clerk*, C. M. Smith.

SEYMOUR.

President, E. G. Wheeler ; *Health Officer*, A. S. Houghton, M.D.; *Clerk*, C. J. Atwater.

SHARON.

President, W. W. Knight, M.D.; *Health Committee*, W. W. Knight, M.D., J. B. Smith, E. H. Bartram ; *Clerk*, W. Baker.

BOROUGH OF SHELTON.

Warden and Burgesses.

SHERMAN.

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SIMSBURY.

Health Officer, C. M. Wooster, M.D.

SOMERS.

President, K. V. Chapin ; *Health Committee*, W. B. Woods, M.D., Wm. McMullen, Jr., A. D. Noble ; *Clerk*, C. S. Fuller.

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President, T. F. Wheeler ; *Health Committee*, M. L. Cooley, M.D., F. D. Bradley ; *Clerk*, C. S. Brown.

SOUTHINGTON.

President, W. S. Plumb ; *Health Officer*, J. H. Osborne, M.D.; *Clerk*, J. H. Osborne, M.D.

CITY OF SO. NORWALK.

Board of Councilmen.

SOUTH WINDSOR.

President, ——— ; *Health Officer*, ——— ; *Clerk*, ———.

SPRAGUE.

President, T. H. Allen ; *Health Committee*, T. I. Stanton, M.D., E. Allen, B. S. Gallup ; *Clerk*, W. D. Nolan.

STAFFORD.

President, A. D. Cady ; *Health Committee*, A. D. Cady, M. I. Cady, J. A. Foster ; *Clerk*, J. A. Foster.

BOROUGH OF STAFFORD SPRINGS.

Warden and Burgesses.

STAMFORD.

President, W. R. Lockwood; *Health Officer*, F. J. Rogers, M.D.; *Clerk*, Geo. Baker.

BOROUGH OF STAMFORD.

Warden and Burgesses.

STERLING.

President, A. L. Corey; *Health Officer*, C. N. Allen, M.D.; *Clerk*, W. C. Pike.

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President, G. W. Tingley; *Health Committee*, G. D. Stanton, M.D., J. J. Purtell, R. Woodburn, G. W. Tingley, F. A. Coates, M.D., W. H. Gray, M.D., A. H. Hinckley; *Clerk*, G. D. Stanton, M.D.

BOROUGH OF STONINGTON.

Warden and Burgesses.

STRATFORD.

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SUFFIELD.

President, E. Halladay: *Health Officer*, J. K. Mason, M.D.; *Clerk*, L. N. Austin.

THOMASTON.

President, A. P. Bradstreet; *Health Officer*, C. F. Smith, M.D.; *Clerk*, F. W. Etheridge.

THOMPSON.

President, L. Holbrook, M.D.; *Health Committee*, L. Holbrook M.D., O. Tourtellotte, L. P. Lamoureux, J. A. Cruff, W. A. Burgess; *Clerk*, O. Tourtellotte.

TOLLAND.

President, E. S. Agard; *Health Officer*, W. N. Simmons, M.D.; *Clerk*, F. T. Newcomb.

TORRINGTON.

President, B. C. Patterson; *Health Committee*, H. J. Pulver, M.D., W. L. Platt, M.D., H. I. Jackson; *Clerk*, W. A. Roraback.

TRUMBULL.

President, J. A. Treadwell; *Health Committee*, Seth Hill, M.D., F. C. Starkweather, M.D., S. G. Beardsley; *Clerk*, S. G. Beardsley.

UNION.

President, L. A. Corbin; *Health Committee*, H. B. Booth, G. E. Willis; *Clerk*, W. G. Howard.

VERNON.

President, ——; *Health Officer*, A. R. Goodrich, M.D., appointed by State Board; *Clerk*, ——.

VOLUNTOWN.

President, T. G. Congdon; *Health Officer*, W. R. Davis, M.D.; *Clerk*, J. K. Bitgood.

WALLINGFORD.

President, W. J. Morse; *Health Committee*, J. D. McGaughey, M.D., W. S. Russell, M.D., H. Davis, M.D.; *Clerk*, Z. P. Beach.

BOROUGH OF WALLINGFORD.

Court of Burgesses.

WARREN.

President, B. E. Carter; *Health Committee*, F. P. Johnson, J. B. Derrickson, M.D.; *Clerk*, J. B. Derrickson, M.D.

WASHINGTON.

President, C. H. Mason; *Health Committee*, O. Brown, M.D., W. J. Ford, M.D., R. A. Marcy, M.D.; *Clerk*, G. C. Ford.

CITY OF WATERBURY.

President, ———; *Health Officer*, ———; *Clerk*, ———.

TOWN OF WATERBURY.

President, E. W. Pinney; *Health Committee*, C. W. S. Frost, M.D., B. A. O'Hara, M.D.; *Clerk*, J. J. Madden.

WATERFORD.

President, J. L. Payne; *Health Officer*, G. M. Minor, M.D.; *Clerk*, H. O. Woodworth.

WATERTOWN.

President, J. Blakeslee; *Health Officer*, W. G. French; *Clerk*, C. L. Mack.

WESTBROOK.

President, H. E. Kelsey; *Health Committee*, H. E. Kelsey, J. Wright, Z. E. Morgan, C. H. Chapman, W. H. Cone, H. C. Jones, D. W. Grosvenor, G. C. Spencer; *Clerk*, D. W. Grosvenor.

WEST HARTFORD.

President, E. T. Stanley; *Health Officer*, F. H. Stadtmueller; *Clerk*, F. H. Stadtmueller.

WESTON.

President, D. S. Parsons; *Health Officer*, F. Gorham, M.D.; *Clerk*, M. V. B. Rowland.

WESTPORT.

President, E. M. Lees; *Health Committee*, D. B. Bradley, Jr., L. T. Day, M.D., F. M. Raymond; *Clerk*, J. G. Hyatt.

WETHERSFIELD.

President, W. W. Adams; *Health Officer*, E. G. Fox, M.D.; *Clerk*, H. Robbins.

BOROUGH OF WILLIMANTIC.

Warden and Burgesses.

WILLINGTON.

President, A Korper ; *Health Officer*, Chas. Essex ; *Clerk*, J. A. Potter.

WILTON.

President, N. M. Belden ; *Health Officer*, A. B. Gorham, M.D.; *Clerk*, J. Gilbert.

WINCHESTER.

President, R. H. Moore ; *Health Committee*, E. H. Welch, M.D., W. S. Hulbert, M.D., S. G. Howd, M.D.; *Clerk*, J. P. Shelley.

WINDHAM.

President, J. W. Webb ; *Health Officer*, C. H. Colgrove, M.D.; *Clerk*, T. J. Kelley.

WINDSOR.

President, J. E. Higgenbotham ; *Health Committee*, A. C. Huntington, J. N. Dickson, M.D., N. S. Bell, M.D.; *Clerk*, N. S. Bell, M.D.

WINDSOR LOCKS.

President, F. L. Bidwell ; *Health Officer*, T. F. McCarty ; *Clerk*, S. B. Douglas.

BOROUGH OF WINSTED.

Warden and Burgesses.

WOLCOTT.

President, H. B. Carter ; *Health Officer*, J. H. Garrigus ; *Clerk*, J. R. S. Todd.

WOODBURY.

President, H. W. Shove, M.D.; *Health Committee*, H. W. Shove, M.D., H. H. Minor, A. D. Warner ; *Clerk*, A. D. Warner.

WOODBRIDGE.

President, J. W. Barker, M.D.; *Health Officer*. S. C. Hubbell, M.D. ; *Clerk*, M. E. Baldwin.

WOODSTOCK.

President, H. R. Safford ; *Health Committee*, J. Spaulding, M.D., G. A. Bowen, M.D., H. R. Lowe, M.D., E. Bishop, H. W. Hibbard, M. L. Gage ; *Clerk*, N. E. Morse.

ABSTRACTS FROM THE REPORT OF SOME OF THE LOCAL BOARDS OF HEALTH.

ANSONIA—*Reuben H. Tucker, Clerk*, Reporter.

The Board has found but very little work to do. We are peculiarly situated here having a borough government in so small a town. The charter of the borough makes its officers a Nuisance Committee with the powers of the Board of Health so far as relates to nuisances, and the Town Board never presumes to interfere with their territory.

When a complaint is made to the Board,—which by our regulations must be in writing, signed by the complainant,—the matter is turned over to the clerk who is required to immediately notify the parties and respectfully request that the nuisance be abated, and if not done to enter suit.

Out of some thirty complaints the past year we have found but one person who refused to comply, and he came to time immediately after suit being commenced, not waiting for a trial.

The borough has built the past season some two thousand feet of sewer, and ordered a large number of sink-drains and closets connected with existing sewers, thereby doing away with cesspools and privies.

ASHFORD—*Nelson Hammond, Clerk*, Reporter.

Ashford is a sparsley populated town with but three very small villages, and the Board have nothing to do but to organize according to law.

BARKHAMSTED—*W. F. Beach, Clerk*, Reporter.

There has been no complaint to the Board. Nor has there seemed to be need of any action on the part of the Board. The Board adopted a set of rules, which we caused to be posted for the observance of the people, which we believe had a good effect.

BEACON FALLS—*O. D. Buckingham, Clerk*, Reporter.

The Board of Health have not done anything during the year. Public hygiene, public sewers, and public water supply, none.

BERLIN—*R. E. Ensign, Health Officer*, Reporter.

The past year has been one of general health, and as the death rate will compare favorably with other towns, it is presumed that the sanitary conditions of dwellings and purity of air is equal to the average. There have been complaints of but four nuisances, three of them remedied satisfactorily and one of them not entirely abated, but am hopeful that another year will see it yet better. The Health Officers of the State received from the Secretary of the State Board, Professor Lindsley, a prodding to the effect that their duties should be active instead of passive, and his words were received with much approbation by sanitarians.

Just at present the voluntary visits of a Health Officer would be received with resentment by many householders, but as soon as the lesson is learned that a "person who keeps himself well will not fall sick," he will be welcomed, even solicited to come, and the time brought nearer when "the child shall die a hundred years old," but before that consummation there must be "precept upon precept" about the most common duties of life, and if they are heeded the coming of the good time accelerated.

BOLTON—*Nathan S. Maine, Clerk*, Reporter.

Owing to the fact that we are a country town, with less than six hundred inhabitants, and being peculiarly situated upon the hills about six hundred feet above the sea level and only about thirty-five miles distant therefrom in an air line, we are "*highly*" favored with good air and pure water, so that we, as a Board of Health, have but a small amount of labor to perform. The dwelling houses in the town as a rule, are owned by those who live in them, have fine drainage facilities, and a careful examination made by the Health Officer reveals the fact that the people have provided a way for the sink drainage to be taken up by absorption or deposited in some secure and safe place; thus by the best means at hand disposing of a very poten, agent in forming, feeding and conveying disease, if not properly guarded against and controlled.

As a rule, the town for the past year has been healthy. Cases of fever very few, no contagious diseases, save a few cases of measles in mild form.

The greatest source of annoyance to the inhabitants of the north end of the town is the effect of drawing off the water from a large reservoir situated mostly in that part of the town, and is

owned by a corporation or company in Willimantic, who persists in commencing in the dog-day season to draw off the water and leave exposed to the rays of the summer sun hundreds of acres of marshy, muddy land, covered with decayed vegetation. All of this might be easily avoided by the company causing the gate to be closed when the water is drawn down to the tops of the unsightly bogs, for then all the water is drawn out that can be of any value.

BOZRAH—*S. G. Johnson, M.D., Clerk Board of Health,* Reporter.

There has been nothing done by the Board of Health of this town the past year. The sanitary conditions of the town are the very best. Therefore there has not been any action taken relating to public hygiene of any description.

BRIDGEPORT—*R. FitzGibbon, Health Officer,* Reporter.

Bridgeport like its sister cities in the State has for several months past published a monthly statement of mortality and the causes of death.

The recent great drouth extending over a large area of country has demonstrated in our city the need of more storage reservoirs. An abundant water supply is an object of the first importance in every city. The Bridgeport Hydraulic Company of our city have secured another site for a new reservoir. It is located seven miles from the city at a point between Tashua and Chestnut Hill, in the town of Trumbull. The construction is nearly completed and will be the largest ever built in this vicinity. It will be called Canoe Brook Reservoir, being the name of the stream on which the pond is located. The pond contains over one hundred acres of ground, is about three-quarters of a mile wide and over two miles long. It is estimated that it will hold over 300,000,000 gallons of water. The dam is situated on the western arm of the valley, extends north and south. The wall proper is 400 feet long and six feet wide, and when completed will be thirty-five feet high. The hills on either side are composed of rock, the embankment will be of clay and concrete. All vegetable matter will be removed from the bed of the reservoir. It is expected that it will be completed this fall so that the pond can be filled by the winter rain. At the highest point the water will be between thirty and forty feet deep. This reservoir will empty into the Mill River reservoir, from thence through the city pipes to the city.

BRIDGEWATER—*Amos Northup, Clerk,* Reporter.

Our Town Board of Health had no business before it during the past year.

BROOKFIELD CENTER—*J. F. Smith, M.D., Chairman Health Com.,* Reporter.

The general sanitary condition of the town during the past year has been good.

The town is situated upon high ground and has no public system of sewerage, though work in that direction is successfully carried on by private enterprise.

The town has been fully alive to all means which would have a tendency to promote public hygiene, and secure a thorough sanitary condition. There have been no epidemics, but, isolated cases of whooping-cough and diphtheria have been unusually prevalent during the past year.

During the summer, four cases of diphtheria developed, one after another, at a farm house where there had been a malignant case of diphtheria the year before. One of these cases—a child—died; with the others the disease ran a mild course and they recovered. The attention of the State Board of Health was called to this instance. Thorough search and investigation was made by the local board in regard to the origin of the disease in this locality and the effectual method for its extirpation. This has been the principal work which the Health Committee has been called upon to do during the past year.

CANTERBURY—*M. H. Sanger,* Reporter.

The Town Board of Health of this town has not met during the year. No occasion for meeting. We are a healthy community. People die here of old age. We have no resident physician in our village. They say it is so distressingly healthy that they cannot get a living and so leave.

CHAPLIN—*Frank C. Lummis, Clerk,* Reporter.

There have been no cases of contagious disease which have come to our notice requiring the action of the Board. There have been no nuisances or sources of filth sufficiently prominent to attract attention. Doubtless a thorough sanitary inspection

would reveal cases of pollution of drinking water, which in my opinion is our worst sanitary sin; though there has been a marked improvement in public opinion in this respect of late years. There have been no undertakings affecting public hygiene during the year. The Health Officer reports no complaints. This is decidedly a negative report, but in a town with no thickly settled community in its limits and the people largely American and owning their own homes there is not the work for a Board of Health that there would be in a town with a large floating population.

CHESHIRE—*M. N. Chamberlain, M.D., Clerk,* Reporter.

The town has been in good condition as regards sanitary matters. An epidemic of measles prevailed during the latter part of the winter and in the spring. It is believed that few escaped who were liable to the disease. A few primary vaccinations have been done but there is reason to believe that there are still many children and young persons liable on exposure to be attacked by the small pox. The Board earnestly desires that all having children and young persons under their charge, will secure for them the protection afforded by vaccination. During the summer the President of the Board has caused the channel of the old canal above the West Cheshire bridge to be cleaned and deepened, so that the areas of stagnant water have disappeared and the current is more rapid than it has been for many years.

As the State of Connecticut publishes no circular on the important matter of school hygiene, the Secretary procured copies of the excellent one published by the State of Pennsylvania, and with the consent and approval of the Secretary of the State Board distributed one to each teacher of the public schools of the town. The monthly Bulletins of the State Board of Health, have been put up as usual in the centre post-office.

CHESTER—*S. W. Turner, M.D.,* Reporter.

The population of Chester, 1293; number of deaths from November, 1890, to November, 1891, eighteen. Not one from infectious disease. Ten over seventy years; average, 79½ years. More births than deaths during the year. Number of persons living over seventy years of age, fifty-one.

CLINTON—*S. S. Wilcox, Clerk,* Reporter.

We have done nothing since the organization of Board and no forecasting for the future. We are a very countryfied country town.

COLCHESTER—*M. W. Robinson,* Reporter.

I was called November 10th inst., to a case of scarlet fever two miles east of town; 14th, to a case in the borough, and 16th, to a case one and a half miles south of borough all attending the same school, primary department Bacon Academy. Have reported the cases and advised closing that room which I think will be done to-morrow. I am unable to trace its origin at present. The Board of Health at its annual meeting failed to elect a health officer.

DANIELSONVILLE—*W. E. L. Raem, Clerk,* Reporter.

A drain has been built by the town to provide for surface water that accummulates for want of proper outlet. The work will cost probably $3,000.

A much needed improvement in way of sanitation is being made about the school building in Danielsonville, where some three hundred children attend school. The outside privies, distant some one hundred feet, are being displaced by the introduction of the Smead Dry Closet system in a brick annex attached to the building to be heated by steam.

Children both young and old, are usually careless in cold and stormy weather, in not putting on their outer garments in visiting inside closets resulting in cold, croup and similar complaints, but by the above arrangement, they need not necessarily contract colds and the like. The principle of the Smead system appears to be almost perfect, and for sanitary reasons alone is considered preferable by many experts to the running water-closets.

DARIEN—*Wm. Freeman French, M.D., Clerk,* Reporter.

A number of meetings of the Committee have been held during the year, all of them having as an object the prevention of the spread of diphtheria, which seems to crop out in unexpected places at frequent intervals.

On the 11th day of October, 1890, the Board met at a private house to find the cause of the outbreak of typhoid fever and

diphtheria then prevailing. The typhoid case preceded the diphtheria by two months. In September five cases of diphtheria, (one fatal), all starting within two weeks, and ranging in ages from three to ten years. On inspection, the cellar seemed to be in a good condition, having been cleaned previous to our visit of at least a cart load of dirt, and quick-lime had been freely scattered about the cellar bottom.

The well situated about forty feet from the house, was located under an old out-building, which had been used as a store-house for vegetables, etc.

The barn yard and water-closet, about seventy-five and one hundred feet respectively from the well, were situated on slightly higher ground. The trend of the surface is towards the well, and under a thin coating of soil is a large ledge of rocks, causing all drainage from the acre or more of ground to be directed towards the probable cause of the diphtheria, i. e. (the well), as the ground on the down hill side of the well, and close to it, is swampy. The well has no ventilation except through the floor of the out-building. In addition to visiting private residences, the Board thought it advisable to look over the school building and ground of the Centre District, as a number of the victims of diphtheria had attended this school before being taken sick.

February 25, 1891, the Committee met at the Centre District school house. The following letter to the Committee man will explain the results of our examination.

To the School Committee, Centre District, Darien :

Sir—The Executive Committee of the Darien Board of Health examined the school house and grounds of the Centre District, February 26, 1891.

(1.) The Committee recommend that the gutter of the highway in front of the premises be opened in order to allow the accumulated water to escape.

(2.) That the cellar of the school house be properly drained, by digging trap ditches at right angles to the drain now running diagonally across the cellar. In order to make these of use, the trunk ditch from the foundation wall of the school house to the highway, should be opened and cleaned.

(3.) That the present well be abolished, on account of contamination by sewage, and a new one dug somewhere on the western

boundary of the school yard as far as practicable from the water-closets.

(4.) The water-closets emptied of their accumulations of filth, and have furnished tight boxes that can be drawn from under the the buildings, and their contents taken to a place of safety.

(5.) Earth should be carted to the northwest corner of the school house, and filled around the foundation wall to prevent the cellar from being flooded after every rain storm.

(6.) The cellar and garret cleaned of waste paper, a standing threat to pupils and building from fire.

(7.) We recommend that larger ventilators be placed in the present flues, to make more perfect the ventilation.

(8.) The front stoop should be made safe by guard rails.

The school investigation of the Board of Health, was undertaken, not so much on account of formal complaints of unsanitary conditions made to the Committee, as that, in their capacity as Health Officers, they should stand between the public and disease, by suggesting the proper means for the preservation of health. A few minor cases make up our year's work.

East Hampton—*J. S. Markham, Clerk*, Reporter.

There has been nothing done in our town relating to hygiene or the principle and rules of health for the year 1891. No new public sewers, no public water supply, no drainage of wet lands. The general health of the town has been good. There has been no contagious disease, no epidemic. We are blessed with excellent springs and wells of water.

Easton—*Wm. Wakeman, Clerk*, Reporter.

Nothing was done by the Board. No meetings were held, as there were no complaints made during the year. As regards the subject of hygiene, I have not seen any of the Board of Education, but presume it is studied in all the schools in town. We have no public sewers, and no drainage has been made to my knowledge the past year.

Enfield—*F. E. Ely*, Reporter.

Some two years ago our village was pretty thoroughly sewered. Since that time the Board of Health has had but little to do. We have one of the best water supplies in the State, and many of the

inhabitants use the water, though some wells are used. We have had a few cases of typhoid fever. With this exception the health of the community is good.

FARMINGTON—*Thomas L. Porter, Clerk,* Reporter.

Our Town Board of Health have not been called upon to act in any case, and consequently have done nothing.

There have been no undertakings in town affecting public hygiene. In 1889, a special law was passed incorporating the Farmington Sanitary and Sewer District, but as yet nothing has been done, as we had no water supply to carry off refuse matter. But Mr. A. R. Wadsworth, of this village, has during this fall carried pipes through our main street to supply water to families from a reservoir which he has on the mountain and which could supply water for a sewer, and I think a sewer will be built in the future.

BOROUGH OF GREENWICH—*George S. Ray,* Reporter.

The sanitary condition of this borough during the present year has in general been good. In the spring we had two or three cases of small-pox, which were quarantined at once to prevent its spreading, and the people were generally vaccinated. The borough has constructed about 2,000 feet of sewers and have caused the low land to be drained.

GREENWICH, TOWN—*W. L. Griswold, M.D., Health Officer,* Reporter.

During the past year we have been visited by unusually extensive outbreaks of scarlatina, measles and whooping-cough. None of these have proven especially destructive to life.

The extension of the system of sewers within the Borough of Greenwich has been continued; about 3,400 feet having been constructed within the year, and 500 feet additional, being already ordered and about to be laid. This work completed, the borough will be more thoroughly sewered than is any town or city within our State, with which I am familiar.

The condition of Byram river, from Glenville to Long Island Sound (which our State Board of Health has declared to constitute a nuisance, and menace to the public health), remains *in statu quo*, except in so far as a benign Providence, very rarely of late, temporarily improves it. The unwholesome condition of the

lower part of this stream, since the time when its head waters were diverted for the use of New York city, suggests the inquiry whether our State has not rights, in non-navigable waters within the State, and which, if such rights exist, are being trespassed, in this case, by the authorities of the city of New York, without consideration or consent.

While acknowledging the right of any corporation, or individual, to transfer to another any dams, retaining walls, or other means of impounding the waters of natural water-courses, of which they may be lawfully seized and possessed the ability of such parties to grant any right to a permanent diversion of such waters from their natural course seems questionable on grounds of common law and equity. Should this conclusion be found correct, the Byram river may yet be once more cleansed by its own waters, as of old, until such time as their present possessor shall have given adequate relief to those who have long enjoyed the sanitary benefits of this stream, and who now suffer through its practical diversion. The remedy suggested by the State Board of Health, for this nuisance, is a sewer of necessary size, constructed from the shoddy mill, in Glenville, to tide water, and affording a sufficient outlet for all house and mill sewage now reaching, and frequently stagnant in, the Byram river. Such a sewer would cost many thousands of dollars, yet it would more than pay for itself in a short time through its beneficial effect upon the health of those living or working near the stream ; in the conservation of human lives, too many of which have already been sacrificed to what are called "Filth Diseases," in that bit of land, perhaps one-quarter of a mile wide by two miles long, lying eastward of Byram river as it reaches Long Island Sound ; the terrritory whence come more than one-half of our cases of diphtheria, scarlet fever and typhoid. Our town attorney has advised us that action on our part would not be perfectly defensible should we radically abate the nuisance. If it be left unabated we are forced to the contemplation of prospective epidemics, of diphtheria, for instance, which may almost with truth, be declared endemic in that locality—add to this the intention declared before three members of the State Board of Health of a manufacturing company employing from 400 to 600 hands, to remove to a distant State should this nuisance remain unabated, and we have some ground for wishing that our statute law might be made to afford some positive assurance of protection to those who

desire, as well personally as officially, to endeavor to remove what has been declared by the highest authority in the State to be a nuisance and menace to the public health.

The possible contamination of the waters feeding Horse Neck brook, which has been for many years the principal source of our ice supply, has engaged the attention not only of our Board, but also of the State Board of Health, three members of which have visited the ground. Active measures are now being taken to protect the public in this important matter.

Whooping-cough was quite prevalent in the spring and early summer, yet, one only of our doctors reported any cases while even he frankly acknowledges his failure to report more than a small part of those he should have done. One death occurred among these eight reported cases.

Measles. In January, February and March, rubeola was epidemic, 306 cases having been reported, with a mortality of less than one per cent.; three deaths resulting in cases where pulmonary complications were especially marked. Several well authenticated instances of former attacks were noted.

Typhoid fever claimed four of the seven attacked: All, save one, of these cases, occurring near the Byram river, the locality furnishing the greater part of the diphtheria and scarlatina cases; the exceptional case was imported, and has after the lapse of about a year, been followed by no further cases in that locality. No positive location of the source of infection in the East Portchester outbreak has been made.

Scarlet fever showed a mortality of eleven in fifty-one reported cases. A majority of these deaths, as of those from diphtheria, occurred within a short time from the onset of the disease, indicating severe types of these diseases.

Diphtheria. Reports of diphtheria cases and reports of death from diphtheria, have, during the past year, followed one another with alarming haste. Of six cases reported six have died. That this is the fact is not necessarily just ground for adverse criticism of the medical attendants, nor of the sanitary conditions throughout the town. Despite our regulation requiring a speedy report to the Board of Health of all cases of contagious, infectious, or malignant disease, it is undeniably true that many such are not so reported, whether by reason of forgetfulness, indifference or willful perversity.

The suggestion is offered that a small consideration be given for every such report, (to be paid by the Selectmen on the order of the Clerk of the Board of Health, if so provided by statute), thus encouraging a closer attention to these matters on the part of practitioners, although I would make each one pay himself for this service, more or less, by the annual payment of a stated sum for a "State License to Practice Medicine," which should be procurable from some designated officer authorized to issue such licenses, and without which non-resident as well as resident physicians should be debarred from practicing within the State.

Small-Pox. In March a U. S. A. private, returning from Texas, developed variola shortly after his arrival here. Two other members of his father's family were soon attacked as was one young woman who visited at their house before the presence of the disease was suspected. Of these, three recovered. Strict quarantine precautions were at once undertaken and a general vaccination ordered of all persons within the town who had not been successfully vaccinated within the five years preceding. Three thousand two hundred points of vaccine virus were furnished gratis to resident physicians as desired by them for use within the town; the supply being continued until further danger was no longer feared. This, in addition to large supplies from private sources, resulted in the vaccination of over thirty per cent. of our population during the months of March and April. As the family presenting the first cases resides in a rather thickly populated part of the Borough of Greenwich we may justly feel that our labor was not in vain. Since the right of a Board of Health to enforce quarantine regulations has been questioned in court, anent the above cases, it is sincerely to be hoped that the law may be rendered free from liability to misconstruction in these matters.

Two cases of true purpura hæmorrhagica, with one recovery, have been among the rarities of medical practice during the year.

GUILFORD—*Charles H. Post, Clerk*, Reporter.

The Board of Health of the Town of Guilford has held no meetings since it was organized a year ago, and consequently has no report to make.

HAMDEN—*Edwin D. Swift, M.D., Health Officer*, Reporter.

Your committee begs leave to report, that during the past year the epidemic which raged so severely over almost all of the civilized world during the latter part of 1889 and early part of 1890, though appearing occasionally during the last winter and spring, has, so far as known to me, developed no new case during the last three months, though its effects are still felt by some of its victims of the past year.

The general health of the town is, I believe, better than a year ago. Scarlet fever has appeared, a few severe cases and several of mild type, which so far as I am aware have all resulted favorably. Typhoid fever, which formerly proved fatal in a number of instances annually, has scarcely been found. Measles, though prevailing to some extent in some portions of the town during the winter, have, as far as I now recollect, resulted favorably. Diphtheria has been fatal in one and perhaps two cases.

I desire to state also that so far as is known to your committee all cases of scarlet fever, diphtheria or typhoid fever which have occurred, have immediately been isolated, and after the recovery or death of the patients the rooms where they were sick or the whole tenement, together with clothing and furniture of every kind, has been subjected to thorough disinfection, which, of itself, or from some other cause, has resulted in arresting the spreading of such diseases to others not living in the families where they originated.

I regret to feel obliged to state that the so-called malarial diseases of twenty years ago are found with us again, though to a limited extent.

In regard to nuisances, I would say that whenever I have received authoritative notice of the existence of one, I have promptly investigated it, and, when necessary, have notified the owner of the place where it was, who has in every instance, I believe, as promptly seconded my desire to abate it.

HARWINTON—*N. A. Wilson, Clerk*, Reporter.

The sanitary condition of this town has been such as not to require any special action from the Board of Health. The public health has in general been good. Take it all together the past year we have cause for gratitude as we have not been afflicted with any severe attacks of disease.

HARTFORD—*W. W. Knight, M.D., Clerk,* Reporter.

The work of the Board during the past year has been limited to the usual routine work of keeping the plumbing and drainage of houses in repair, removal of nuisances, privy vaults, etc., inspection of plumbing of new buildings, prevention of the spread of contagious disease, etc.

The usual number of new sewers have been built, all ventilated, and the usual number of ventilators have been put into the old sewers.

No public works of any special magnitude affecting hygiene have been undertaken.

HEBRON—*F. C. Bissell,* Reporter.

No business was done by the Board during year.

Nothing to report.

JEWETT CITY—*Geo. H. Jennings, Clerk,* Reporter.

There have been a few complaints of cesspools and privies; more frequently the bad condition of some vault or cesspool was noticed by some member of the Health Committee and, in every case, a prompt abatement of the nuisance was made by the proprietor.

Diphtheria has been present every month. The disease has not been confined to any particular locality. In no instance has it spread to adjoining families; by prompt action it has been confined to the family where it first occurred.

The degree of contagiousness as well as that of tolerance is shown in two instances. One family when seen had three children sick with diphtheria, in two cases, children, aged two and four, the membrane had invaded the larynx. There were four young children that were well. The sick were separated from the well. *All* were subjected to treatment and no new cases developed. After the children were well the rooms were disinfected, as I supposed, thoroughly; yet, one month later, a child that had spent some time at play in the rooms had diphtheria. In this case isolation of the sick member from the rest of the family, though strongly insisted upon, was not practiced and as a consequence five members of the family had the disease. Another family was seen where the child was supposed, after an illness of ten days, to have pneumonia. The odor that was

plainly perceptible from putrid membrane greeted me immediately upon opening the door. The throat and sides of the mouth and nostrils were full of membrane and ulcerated spots. Yet this family of five young children, all living in one room and being constantly around the sick child, lying on the lounge beside the patient, had remained well and not one of them had the disease. In this instance it would indeed seem that "There's a special providence over fools and children."

KENT—*B. G. Pratt, Clerk,* Reporter.

There has been very little sickness in town the past year. There has not been a case reported of typhoid fever, scarlet fever, or diphtheria, and much less pneumonia than years before. The soil in this section is sand and gravel, making it unnecessary for public sewers; the land is rolling and inclining towards the river and that is rapid. The private cesspools answer all purposes for drainage, as the village is small. In September there was some complaint about diarrhœal disease among children and some adults who used water from springs and wells that were nearly dry. The village has a good water supply from a reservoir about a mile distant that is fed by springs. The water is conveyed by six-inch iron pipe and has 160 feet fall from the reservoir ; the springs are several of them from 100 to 300 feet above the reservoir. The charcoal filter was renewed a short time since (within a month). There was some fault found in summer that the water was warm and not agreeable to taste or smell, but it was working, as large bodies of fresh waters do annually, some time during the hot weather. Yet we venture to say we think our water supply is better than 99 out of 100 villages supplied from reservoirs.

LEDYARD—*Chas. A. Gray, Clerk,* Reporter.

As there has been no contagious diseases in the town during the past year, we have not been called upon to act and consequently we have nothing to report.

MANCHESTER—*B. F. T. Jenney, Clerk,* Reporter.

The Board has not had much to do and has not been called together at all, and the Health Committee has met but once, at which time voted that the chairman and clerk draw up and pub-

lish a set of "Rules" for the government of the public in regard to sanitary action, which was done and published in our local paper. There has been but few complaints, and they were easily adjusted. I requested the Cheney Bros. to give me the particulars in regard to a new reservoir they have the past year completed, and how they progressed in regard to sewerage. I enclose their communication.

In North Manchester they have in successful operation, the water supply, established two years ago, which is very satisfactory. They are perfecting the sewerage arrangements.

The Case Bros. have constructed a reservoir upon a high point above the flourishing village of Highland Park, into which pure spring water is pumped, and from thence distributed to the mills, store and houses throughout the village. I think our town is well off in a hygienic point of view.

MANSFIELD CENTRE—*E. G. Sumner, M.D., Chairman,* Reporter.

The town of Mansfield has been usually healthy.

The sanitary condition of the town is fairly good. Very much more attention has been paid to sink drains and water supplies than was a few years ago, and it is quite noticeable that fatal cases of typhoid are much more rare than before these subjects were agitated by the Board of Health. Our local Board has met from time to time, and the past year no particular nuisance of much magnitude has engaged our attention. No public sewers or public water supplies are used in our town. We have some very valuable wet lands that have been reclaimed by drainage. The town of Mansfield is terribly "spread out," requiring *ten* (10) public post offices to keep the reading community in a healthy intellectual condition.

MERIDEN, CITY—*Hon. Benj. Page, Mayor,* Reporter.

There has been no unusual amount of sickness in Meriden during the past year and our health officials have only been required to attend to their ordinary duties of enforcing our sanitary laws and rules. Efforts have been made to secure the prompt removal of garbage, to remove all obstructions from running streams, into which private sewers empty and to promote cleanliness everywhere. Our water works having become inadequate to supply

the wants of our growing city, we have been during the last two years constructing additional works, at a cost of $200,000. In locating the new works the question of the quality of the water to be secured was made one of paramount importance. The land constituting the watershed is mostly mountain land with very little cultivated ground, and we have a nice reservoir with steep banks, and a depth of water at the gate house of 33 feet. The works are now practically completed and everything indicates that the reputation which Meriden has enjoyed for having water of excellent quality will be fully sustained.

Regarding the matter of sewerage, would say that after long and careful study and investigation, and with the approval of the State Board of Health, our city has adopted the broad irrigation system. We have purchased about 150 acres of land, consisting mostly of sand and gravel to a depth of several feet, and shall push forward the work of laying sewers as rapidly as possible next season. Although this system may be to a certain extent experimental, we are assured by competent engineers and scientific men that with the kind of land we have purchased it will prove a success. As this is perhaps the largest city in the country which has adopted this system, its progress will undoubtedly be watched with a great deal of interest.

MERIDEN, CITY—*Health Committee's Report.*

The health of the city has been good during the year, no epidemic having appeared. The service of collecting garbage has been fairly satisfactory, but the Committee would suggest that the time has come when contractors should be obliged to deposit garbage outside the city limits. Most of the nuisances which the Committee have inspected have been of such a character that a sewer system only can abate them. They would recommend that some method be devised by which delinquents in the matter of cleaning cesspools and out-houses can be punished. The present system does not seem to accomplish it.

MERIDEN, TOWN—*James T. Kane, Health Officer,* Reporter.

The total number of complaints received by me has been 261, many of them were of light character.

Commencing with the month of January, and during the earlier part of my official term, a number of cases of diphtheria of

a malignant type were reported, all of which I personally investigated and the premises were fumigated and disinfected under my supervision.

Occasionally during the heated term a few cases of scarlet fever and diphtheria were reported and I would remark here that in every case in which I was called I found the surrounding sanitary conditions among the worst. I was surprised that during the heated term that the death rate was so near normal, but this should not delay the city from establishing a thorough sewerage system as soon as possible.

The contagious diseases reported to me during the year were as follows :—

Scarlet fever	68
Diphtheria	38
Measles	66
Malaria fever	7
Chicken pox	4

The remainder of the complaints were from property holders on account of defective sewers and cesspools, etc.

I have found that in most cases property holders were ready and willing to comply with the city by-laws, after being notified, and the support I have received from His Honor, the Mayor, and your Committee, has greatly assisted me in the performance of the duties of the office.

MIDDLETOWN—*R. S. Hayes, Clerk,* Reporter.

A meeting of the Health Committee was held this day, all the members being present.

D. J. Donahoe was elected Chairman, and R. S. Hayes, Clerk. *Voted,* That this Committee meet on the third Mondays of January, April and July, and that each member of the Committee have power to call a special meeting whenever it may deem advisable.

In accordance with the preceding vote, the Health Committee held stated meetings at the times specified, and there being no business brought before them, there is nothing further to report.

MILFORD—*James McCarthy, Clerk,* Reporter.

The health of the town of Milford is excellent and has been for the year 1891, and it still continues to be good. I know of only

one case of typhoid fever in this town for the past year, and as he was a young man going to school in New Haven, we don't think the disease originated here. There has been no drainage of any great consequence done the past year, but I am glad to be able to report that the privies of the Graded School have been put in good sanitary condition within the last six months. There has been scarcely any cases of scarlet fever, measles or diphtheria that I know of during the year.

NAUGATUCK—*M. H. Lawlaus, Esq., Clerk,* Reporter.

The mortality recorded during the fiscal year ending Sept. 1st, 1891, is 131 deaths from all causes, which gives an annual death ratio for Naugatuck of 21 per 1,000 population, according to the Town Clerk's record.

We discover that more than one-half of the deaths occurring in the spring months were of pulmonary origin, while those during the summer months were from derangements of the alimentary tract.

The heated months of the year have been very fatal to the infant population and many have died from cholera infantum.

There has been reported to this office the following cases of contagious and infectious diseases during the year, viz :

Scarlet Fever.......	22—	Deaths,	none.
Typhoid "	3	"	2
Diphtheria	1	"	none.
Measles............	30	"	4

Scarlet fever occurred in 13 different families and each family received promptly copies of sanitary regulations, provided for them through the efficiency of our State Board of Health. (Since the 1st of September one case of scarlet fever has died, which was buried without a funeral and in a thoroughly antiseptic manner). The appearance of scarlet fever in so many localities and so entirely separate in its outbreak, does not justify us in saying it is epidemic, but rather it is endemic, and only for the intelligent care and skillful management of the cases in hand, have the masses of children been saved from this dreadful malady.

Each house will be placarded in the future by the Health Officer. See Rule XVIII as modified by a meeting of the Committee Sept. 4, 1891.

Typhoid fever has not appeared as often as might seem probable owing to the exceedingly dry weather at the beginning of summer, and the lowness of water in the reservoir of the Water Company. Yet there are two reasons for our immunity from it; first, the supply of water furnished by the Naugatuck Water Co. is quite pure and certainly free from the bacillus of typhoid fever, and secondly, a great many families use it in the sections of town formerly scourged by this pestilence.

Diphtheria has only been slightly observed, very much to the astonishment of the many who have nostrils regaled by odors varied, noxious and seemingly pestilential, as they pass along the water courses or open sewers of Naugatuck, plus the sewage of Waterbury, which finds its way down the Naugatuck river.

The only consolation one has who gets a whiff of the emanations of the river, is that whatever composes the aroma it cannot possibly be animalculæ or living germs of disease, for the waters of the Naugatuck river are so filled with mineral acids, alkalies and solutions of brass in the city of Waterbury that no fish, eel, frog, or wiggler can live in it, and even mosquitoes have to find other waters in which to propagate their species.

We have discovered generally that where the strongest odors arise from the river, a drain was found close by that did not quite reach the water in its discharge, or a general dumping ground had been made of the river banks.

Owing to the character of some of our factories we find that we are often compelled to breath unpleasant odors.

Measles has been quite prevalent and there are many people in town who seem to favor the idea that it is better for the children to have them while young instead of joining heartily in with the idea of isolating the disease and trying to lessen its spread, and by a combined effort ultimately stamping it out. Besides, some people do not seem to realize that measles often attack the same person more than once, and having the disease does not always give immunity from a second attack.

Sewage is too weighty a question for us to solve.

Inasmuch as a full and comprehensive code of rules is now in force and a number of blank 'forms on hand, it has been decided to recommend to the Board of Health in its considerations at the annual meeting on the first Wednesday after the first Monday in October, that instead of appointing a Health Committee of 5 or 7 members, it appoint a Health Officer and Clerk, who may be

empowered to transact all business that could be done by a committee, and at less expense to the town.

Complaints properly signed and filed in this office have been 14 in number. All but one have been disposed of satisfactorily. Some legal advice has been essential, but no suits have been entered into.

The Board of Health on Sept. 4th revised the sanitary rules and regulations adopted in the previous year.

NEW BRITAIN—*L. H. Pease, Mayor.*

In a general way it can be said that the city during the year has been remarkably free from contagious diseases. Our Board of Health have been quite active, and probably the city has been in a better sanitary condition than ever before.

Our already extensive sewer system is gradually being extended each year by the additions of small sewers. We have undertaken no large work of this kind during the year.

Our water supply has been adequate, but the lake is lower than it has been for a good many years. Our supply has for several years past been somewhat limited, and we have already anticipated our probable requirements by an addition, which is now well under way, that will nearly double our storage capacity.

We have now no wet or low places that are not properly drained.

NEW HAVEN—*Ward Bailey, Clerk,* Reporter.

The past year has been quite an eventful one for the New Haven Board of Health. In addition to the usual routine work of the Board, several important laws have been enacted by the Court of Common Council which deserve more than a passing notice. On May 15th, 1891, a "Health Ordinance" was passed by that body. Prior to said date, and since June 15th, 1888, the ordinance in essentially the same form existed as a Rule or Regulation of the Board. The object gained by its passage as a city ordinance was two-fold. In the first place, criminal, and therefore prompt prosecutions could be brought for its violation without question, and in the second place the more prompt and accurate reporting of cases by physicians hitherto unwilling or careless.

I annex a table of the cases reported to this office from June 15th, 1888, to November 15th, 1891, and am pleased to say that

I believe to-day that cases are promptly and conscientiously reported.

From June 15th, 1888, to January 1st, 1889 :

Diphtheria	63
Scarlet fever	20
Typhoid fever	127

From January 1st, 1889 to January 1st, 1890 :

Diphtheria	296
Scarlet fever	120
Typhoid fever	72

From January 1st, 1890, to January 1st, 1891 :

Diphtheria	304
Scarlet fever	98
Typhoid fever	120

From January 1st, 1891, to January 1st, 1892.

Diphtheria	208
Scarlet fever	349
Typhoid	106

I will call attention to one matter which perhaps demands more than passing notice.

Upon July 6th, 1891, the "Plumbing Ordinance" was duly approved.

For several years the matter had been pending before the Ordinance Committee in various forms. The present ordinance deals chiefly with new plumbing, and is a step in the right direction. It is to be hoped that soon the same may be amended or enlarged to cover old defective plumbing as well, for it is with this latter class of work that the Board is daily brought in contact.

The Board has appointed a competent, practical inspector of plnmbing, who devotes his entire time to the work and is kept very busy. Daily records of inspections are carefully kept and filed, from which some interesting and valuable facts may be collected later.

The Board has been active during the year in abolishing offensive vaults and cesspools on several streets, and in abating the usual nuisances. Several public hearings, which were largely attended, were held in reference to abating nuisance caused by foul odors rising from the premises of the "Old Colony Distillery Co." The magnitude of the nuisance to the public and the

amount of money involved by the company, made the matter one of serious consideration. The Board after several personal inspections and careful deliberation were of the opinion that the feeding and herding of cattle under the conditions practiced at said distillery, could only result detrimentally to that neighborhood and the traveling public, and hence ordered and enforced the removal of the cattle and the cleaning of the premises.

Plumbing Ordinance.

Section 1. The Board of Health may license proper persons to carry on the business of plumbing.

Sec. 2. No person shall carry on the business or do any work of plumbing unless he shall have first obtained a license and registered his name and place of business in the office of the Board of Health, and notice of any change in the place of business of a registered plumber shall be immediately given to said Board; provided that this section shall not apply to employes while working for licensed plumbers.

Sec. 3. Every building used as a dwelling in which plumbing arrangements are to be placed shall be supplied with a water-closet for every fifteen persons, conveniently located and constantly supplied with water. All water-closets constructed after the passage of this ordinance must be supplied with water from a special tank or cistern, not used for any other purpose, unless permission has been first obtained from the Board of Health to use other fixtures. It shall, in all cases, be connected directly with the general or common drain pipe of the house. The use of pan-closets is prohibited.

Sec. 4. When the water-closet is located twelve (12) or more feet from the soil or drain pipe, the trap must be protected from siphonage by a special air pipe of not less than two (2) inch bore. The common drain pipe shall be separately and independently connected with the public sewer, wherever such sewer is provided, and if there is no such sewer, with a properly constructed cesspool of a capacity approved by said Board.

Sec. 5. Every water-closet shall be provided with a local vent, the material of which shall be copper, cast-iron or galvanized iron. The diameter of this vent shall be for one closet not less than two (2) inches, for two (2) and not more than four (4) closets not less than three (3) inches, and for any number exceeding four, such increased diameter as the Board may direct. It shall be

carried upward and into a heated flue provided for the purpose, or into the kitchen chimney. In either case it must be entered above the highest opening in said chimney, or in such other manner as said Board may direct.

SEC. 6. Where it is necessary to lay soil pipe under the ground, it shall be of a quality known as extra heavy pipe. The pipe passing through the walls of the building, and to a distance outwardly of at least ten (10) feet from the inside face of foundation walls, shall also be extra heavy. All cast-iron pipe must be sound and free from holes, and other defects, of a uniform thickness, and of not less than the weights specified below for the corresponding diameters, and before use shall be thoroughly coated inside and out with coal-tar or an equivalent substance.

EXTERNAL DIAMETER.

ORDINARY PIPE.				EXTRA HEAVY.			
2	inches,	3¼	lbs. per foot.	2	inches,	5½	lbs. per foot.
2	"	4½	" "	3	"	9½	" "
4	"	6½	" "	4	"	13	" "
5	"	8	" "	5	"	17	" "
5	"	10	" "	6	"	20	" "

SEC. 7. Drain and soil pipes through which water and sewerage is used and carried shall be of sound iron when within a building, and at least four (4) inches in diameter. They shall be securely ironed to walls, or laid in trenches of uniform grade, or suspended to floor timbers by strong iron hangers, or as the said Board may direct. (The space between these hangers shall not exceed ten (10) feet.) They shall have a fall towards the drain or sewer and soil pipes, shall be carried out through the roof open and undiminished in size to a distance of not less than two (2) feet above the roof or more, if the said Board shall so direct. Changes in direction shall be made with curved pipes, and all connections with pipes shall be made with Y branches.

SEC. 8. All vertical lines of soil pipe twelve (12) feet or more in length, must extend up through and two (2) feet above roof, undiminished in size, or more than two (2) feet, if said Board shall so direct, or they may be connected with main soil pipe above the highest plumbing fixture. All branch lines of waste pipe fifteen (15) feet or more in length, must be carried up through and two (2) feet above roof or into main soil pipe, above highest plumbing fixture. When two or more fixtures, such as

sinks, bowls or baths are used on one line, the waste pipe must be of iron and not less than two (2) inches in diameter. All pipes must be four (4) inches in diameter where they pass through the roof.

SEC. 9. When the house drain is tapped, it must be furnished with a brass clean-out. There must also be provided an inlet at least four (4) inches in diameter for fresh air to enter the drain on house side of trap. This inlet is to be carried to the outer air, opening at such distance from nearest window as will be satisfactory to said Board and where it cannot possibly contaminate the cold air box of a furnace.

SEC. 10. Rain-water leaders must never be used as soil, waste or vent pipes, and when connected with soil or drain pipes shall be suitably trapped.

SEC. 11. Sewer soil pipes or waste pipe ventilators shall not be constructed of brick, sheet-metal or earthen-ware, and chimney-flues shall not be used as such ventilators.

SEC. 12. Joints shall be run with molten lead, packed with oakum, thoroughly caulked and made tight. Connections of lead pipes with iron pipes shall be made with brass ferrules, properly soldered and caulked to the iron. The lead pipe must be attached to the ferrule by a wiped or overcast joint.

SEC. 13. All connections of lead, waste and vent pipes shall be made by means of wiped joints. The joints between the soil pipe and water-closet shall be made by means of a brass or lead connection.

SEC. 14. Every sink, basin, bath-tub, water-closet, slop-holder, and every fixture having a waste pipe shall be furnished with a trap. Traps shall be protected from siphonage or air pressure (when such make of trap is used that is liable to siphonage), by special air pipes of a size not less than the waste pipe, but air pipes for water-closet traps shall not be of less than two (2) inch bore. Air pipes shall be run as direct as practicable, and shall not be of less than four (4) inch bore where they pass through the roof. Two or more air pipes may be connected together, or with a soil pipe, but in every case of connection with a soil pipe, such connection shall be above the upper plumbing fixtures of the building.

SEC. 15. Waste pipes from refrigerators or other receptacles in which provisions are stored, shall not be connected with a drain soil pipe or other waste pipe unless such waste pipes are provided

with traps suitably ventilated, and in every case there shall be an open tray or sink between the trap and refrigerator.

SEC. 16. Pipes and other fixtures shall not be covered or concealed from view until after the work has been examined by an inspector of said Board; and the plumber shall notify the Board when the work is sufficiently advanced for inspection. When necessarily placed within partition walls, soil and waste pipes must be covered with wood-work so fastened with screws so as to be readily removed. In no case shall they be absolutely inaccessible.

Sec. 17. No steam exhaust or drip pipe shall connect with the sewer or with any house drain, soil pipe or waste pipe, but blow-off pipes may discharge into a suitable tank or condenser, from which a suitable outlet to the house drain may be provided.

SEC. 18. A suitable grease trap must be placed under the sink of every hotel, restaurant, eating-house, or other public cooking establishment.

SEC. 19. The plumbing must be tested with the water-test by the plumber, in the presence of an inspector of said Board, and all defective joints made tight. Defective pipe discovered must be removed and replaced by sound pipe.

SEC. 20. All materials must be of good quality and free from defects; the work must be executed in a thorough and workmanlike manner.

SEC. 21. Any license granted under the provisions of this ordinance by the Board of Health may be revoked at the pleasure of said Board.

SEC. 22. For every license granted under the provisions of this ordinance, there shall be paid to the Clerk of the Board of Health the sum of one dollar for the use of the city.

SEC. 23. All previous ordinances, rules and regulations inconsistent herewith are hereby repealed.

SEC. 24. This ordinance shall take effect on its passage.

Approved July 6th, 1891.

To take effect July 12th, 1891.

EDWARD DOWNES,
City Clerk.

Health Ordinance.

To the Honorable Court of Common Council of the City of New Haven: Be it Ordained:

Section 1. That *small-pox, scarlet fever, diphtheria, membranous croup, typhoid fever, typhus fever, Asiatic cholera, yellow fever*, and *measles*, be and they are hereby declared to be dangerous to the public health, and they are hereby declared to be contagious diseases within the meaning of these by-laws.

Sec. 2. Every physician practicing within the town of New Haven shall report in writing to the Board of Health of the Town of New Haven within twelve hours after he has discovered the nature of the disease, or immediately, if practicable, specifying the name, age and address of each patient having either of said contagious diseases for whom said physician has prescribed or attended, or has been called upon to attend; also the nature and duration of such disease, the number of children, also the families in said house, the school attended, if known, factory, shop or place at which said patient works or is employed.

Sec. 3. Every attending physician shall also report in writing to said Board, the name, age, and address of every person who shall have died of any contagious disease, within twelve hours after he shall have been informed of such death, and the specific name and type of such disease.

Sec. 4. Every lodging-house keeper, hotel keeper, house holder, or person having charge of any public or private institution, or any master of any vessel within the town of New Haven, in whose house, hotel, institution or vessel any person is sick with any of the aforesaid described diseases, unattended by a physician, shall report the same to said Board within twelve hours after it shall come to his or her knowledge.

Sec. 5. No person shall, without a permit from said Board of Health, carry or remove from one building to another, or from any vessel, ship, boat or enclosure, any person sick with any of the diseases specified and described in the first section of these by-laws, or any clothing or other articles which have been, or which may have been exposed to infection, nor shall any person expose one sick with any of the diseases specified and described in the first section of these by-laws, nor the body of such person, or any article in his possession, or cause or contribute to or promote the spread of disease from such sick person or the body thereof.

SEC. 6. No superintendent, principal or teacher of any school, no parent or guardian of any child attending school, shall knowingly permit a child sick with *small-pox*, *scarlet fever*, *diphtheria*, *membranous croup or typhus fever*, or any child residing in a house in which such disease exists, to attend any schools in the town of New Haven, without the permission of the Board of Health of said town.

SEC. 7. No person sick with any of the diseases specified in Section 1 of these by-laws shall come into, nor shall any person bring or cause to brought into the town of New Haven, any person known to be, or reasonably suspected to be, sick with any of said diseases specified in Section 1 of these by-laws, or of having any article or clothing which has been exposed to infection from any disease described in Section 1 of these by-laws, without a permit from said Board of Health.

SEC. 8. No person shall hinder or prevent the Board of Health of said town from securing the isolation of any person sick with the diseases described in Section 1 of these by-laws, or of the disinfection of any premises, or article or clothing which have been exposed to infection, or the using of proper methods and means which may be proper to control the spread of such disease or diseases.

SEC. 9. There shall be no public funeral of any person dead from *small-pox*, *scarlet fever*, *diphtheria*, *membranous croup or typhus fever*, without the permit of said Board of Health.

SEC. 10. No one shall enter a passenger car, street car, steamboat, hack, cab, stage, or other public conveyance, wearing or having in his or her possession any clothing or other articles with which said person shall have had in attendance upon any person sick with *small-pox*, *scarlet fever*, or *typhus fever*, without having had the same disinfected to the satisfaction of said Board of Health.

SEC. 11. Any hack, cab, stage, horse car, steam car, steamboat, vessel or other public or private conveyance in which any person is reasonably believed to have been carried or known to have been carried or transported while suffering with *small-pox*, *scarlet fever*, *typhus fever*, or *yellow fever*, shall not thereafter be used for the carrying of any passenger until such vehicle, car, steamboat, or vessel shall have been disinfected to the satisfaction of said Board of Health.

SEC. 12. Every person violating any of the provisions, section or sections of these by-laws, on conviction, shall pay a penalty of not more than one hundred dollars.

In Court of Common Council, read, accepted, and ordinance adopted.

Approved May 15, 1891.

To take effect May 22, 1891.

A true copy of record.

Attest: EDWARD DOWNES,
City Clerk.

NEW LONDON, CITY.

REPORT OF COMMITTEE ON HEALTH AND NUISANCE.

To the Honorable Court of Common Council:

Gentlemen:—The work of the Committee on Health and Nuisance during the past year has been prosecuted upon practically the same basis as in preceding years.

It has been the desire of the members of this Committee to make the work as practical and effective as possible, without being oppressive. At the same time we have occasionally found it necessary to be aggressive in order to secure desired results.

As in preceding years, a policeman, William B. Burke, has been detailed as Sanitary Inspector, and to his efficiency and good judgment is largely due the success that has attended our efforts.

The rapid extension of sewers should be a source of gratification to every citizen. We hope the time is not far distant when every street of any importance in our city shall become a part of the sewer system.

While many property holders avail themselves of the first opportunity to connect their premises with the sewer, we regret to say that very many fail to do so. This is a serious mistake, so far as the health of the public is concerned, and, we believe, in most cases, poor economy for the individual.

We recommend a change in the sewer law, so that orders from the Sewer Board to connect with sewers may be enforced by a more direct process than the present law admits of.

We condemn the practice which has always existed with some of the farmers who bring milk into the city, of delivering milk to their customers and at the same time collecting swill. We believe the practice detrimental to health.

The citizens have this matter in their own hands, and if they will but refuse to take milk from any one who continues such practice, the trouble will very soon be abolished.

In our judgment it would be wise if the work of cleaning the streets should come under the charge of the Health Committee, and this work, as well as the cleaning of cesspools and privy vaults, be done by the city proper; means being provided so that all matter collected could be disposed of in an absolutely safe manner. We hope the financial condition of the city will soon be in such condition as will permit of an appropriation for this purpose.

With the exception of measles, there has been no epidemic of contagious diseases during the past year, and the general health of the city may now be considered good.

We append the report of Inspector Burke.

Respectfully submitted,

GEORGE C. STRONG,
E. N. CROCKER,
H. J. SAVAGE, } *Committee.*

NEW LONDON—*Wm. B. Burke, Sanitary Policeman*, Reporter.

To Geo. C. Strong, E. N. Crocker, H. J. Savage, Committee on Health:

Gentlemen:—The work of inspection during the past year was about the same as in former years. The nature of the work done was, the emptying of privies and cesspools, the cleansing of cellars and barns, cleaning and removal of hog-pens, ventilation and trapping of sink pipes, and the general cleansing of premises.

Since my last report, the physicians of this city reported one hundred and sixty-nine cases of contagious and infectious diseases, classified as follows: Diphtheria, sixteen; scarlet fever, twenty-five; typhoid fever, twenty; measles, one hundred and eight. Out of the number reported, nine cases terminated fatally —diphtheria, two; scarlet fever, four; typhoid fever, three.

When a case of contagious or infectious disease was reported, the inspector visited the family of the patient and insisted on the isolation of the sick, and procured proper disinfectants, and gave the same to those who could not afford to purchase, with instructions how to use them. But isolation is almost impossible

in some of the tenements in this city where people are huddled together, six to nine families in a house, and some houses not fit to live in, having the greatest number. The owner of one of these places told me he knew that the house was unfit to live in, but the character of the people who live in it was such that they could not get any other house to live in, and they must have some place to stay.

Disinfection of houses, bedding and clothing was carried out where cases of a contagious or infectious nature proved fatal, and also when the patient recovered.

Numerous complaints were made by people who live in certain sections of the city, of the stench that arises from the privies and cesspools in the said sections. The complaints are that they cannot open their doors or windows during the hot weather, because of the stench coming from these disease-breeding pits.

The present condition of these cesspools and privies endangers the health of the people living in the vicinity of the same.

Now something should be done to compel the owners of these premises to connect the same with the sewer, as this is the only way that this nuisance can be abated, and the rights and health of the community protected. It is no satisfaction to a man or woman to go to the expense of connecting with the sewer if their neighbors at both sides of them are allowed to maintain nuisances in the shape of privies and cesspools.

I do suggest that when people are in search of a tenement, the first question they ask the owner should be, "How is the house drained?" But little attention is given to this most important question.

I would remind you of the trouble experienced during the past three months, of your inability to have the work of emptying privy vaults and cesspools properly attended to. You are aware that there is only one man with a pumping apparatus allowed to do this work in the summer time. Now this individual is under no obligation to do the work for you, as officials, or for any other citizen who may require his services.

I do suggest, as this man is allowed to carry on his business during the hot weather, that some means be resorted to compelling him to do the city work quickly. Vaults and cesspools fill rapidly during the summer months, in fact, owing to the amount of water used, they fill in a few days.

Now, an order is issued to the owner to have a vault or cesspool emptied, but the man who is allowed to do this work cannot be found, and the nuisance has to take care of itself, the city having no facilities for abating it.

Another matter is the complaints made by people who do not live in the center of the city, of the fact that the parties, whose business it is to collect ashes, rubbish, and such, do not visit their sections, and as a result, when their premises are visited, I find heaps of rubbish in their back yards, or in the streets in front of their premises. They justly claim that their taxes are the same in proportion as in other sections, yet no facilities are afforded them to get rid of the accumulating rubbish. They request that the ashman visit their localities at stated times and remove the rubbish. Now, this is a reasonable request, and should be granted. Respectfully submitted.

NEW MILFORD—*Alex. Levy, Clerk*, Reporter.

The Board have not been called upon for action, with the exception of twice, to abate small nuisances, which were promptly attended to by the owners of the property.

NORTH STONINGTON—*Nelson A. Brown, Clerk*, Reporter.

Our Town Board has done but little during the past year.

Early in the month of May I was notified, as Clerk of the Board, that four dead horses (the accumulations from the yards of an extensive horse dealer), were lying in a pasture back of the village, that when the wind was from that direction they had become offensive, etc.

Prompt action was taken and the owner of the premises caused the same to be buried at once. Our town possesses good natural drainage, and no contagious diseases have visited us the past year.

NORWICH, CITY—*Herbert M. Bishop, Chairman of Health Committee*, Reporter.

Personal visitation and examination have been made of upwards of 150 cases of nuisance complained of, consisting of overfull and offensive privies and cesspools, broken and leaky drains, sewering into streets and neighboring land, burying of privy

contents in gardens, offensive rubbish heaps, damp and filthy cellars, untrapped sinks, storage of fertilizers in proximity to dwellings, shipping of offensive bones, dead animals in ponds and brooks, and the throwing of rags, paper and other filth out of windows. All of these have been promptly abated without prosecution. A large portion of the Franklin Street Brook has also been covered in, thus doing away with the unsightly and dangerous condition which had been a constant source of complaint. The large ventilating chimney built over said portion of coverd brook, removing all objections heretofore urged against covering the brook in part, until in course of another year when all tributaries thereto will undoubtedly be covered. The Health Committee also feel gratified at the encouraging prospect of soon having its endeavors to establish a garbage crematory crowned with success. During the year the Committee had not been called upon to administrate in any case of contagious or other diseases.

HEALTH BOARDS.

Few places can boast of the natural advantages which our charming city possesses in its sanitary environments. Our bold and lofty hills, deep valleys and rapidly flowing streams provide ready and brisk escape for the water with which nature so thoroughly purifies the earth and air, and give ample opportunity for the removal of deleterious wastes. Even with these advantages nature will not do everything for a thickly settled community.

The Town Board of Health, by statute, consists of the Selectmen and Justices of the Peace. They have authority to, and usually do, annually appoint a Health Committee of seven members, composed of leading physicians and practical business men.

The Common Council annually delegates its sanitary powers to a Health Committee of three members, one of which is usually a physician and another the Chief of Police. These committees have ever been active in pressing the inauguration and extension of sewerage systems, in preventing the pollution of our streams, and in checking at the outset anything which had the appearance of an epidemic.

SEWERAGE.

No work which municipalities are called on to perform is more important from a sanitary view, which is the most important view of all, than that of sewerage, yet on the principle of "out of sight, out of mind," it is one the public generally appreciates too little. Many cities after introducing a water supply wait a long time before inaugurating a system of sewers, thus reversing the true plan, which should be to build the sewers first. Norwich began to build sewers almost immediately after completing the water works, and has kept at it pretty steadily since, until we now have 12½ miles of sewers, of which 3½ miles have been built during the past four years. As there are 38 miles of streets, some sewers must of course be built each year as the city grows, but probably in few cities of its size has the sewerage kept better pace with the building up of the city. Largely through the efforts of the Board of Health a system of sewers was begun in Greeneville soon after the addition of that suburb to the city. About 1¾ miles of sewers have already been built there, at a cost of about $40,000, of which about $5,000 was expended during the past four years. The total cost of sewers of the city to date is about $192,000, of which $32,000 has been expended during the past four years.

Our system is the "combined," so called, in which storm water as well as sewage is removed, giving facilities for rapidly freeing the streets from water, making the expense of street repairs less, and avoiding the deep gutters along and across streets which are such an inconvenience and discomfort to public travel in some of our neighboring cities.

HOUSE DRAINS.

The appreciation of the importance of good sewerage, house drainage and plumbing has grown very rapidly with our people the past few years. In selling lots and houses, among the first questions to be met are the following: "Is there a sewer in the street?" "Is the house connected with it?" "Is the plumbing properly arranged and ventilated with the soil pipe extending through the roof?"

A little while previous to the organization of this Board the City Council passed an ordinance regulating the laying of private drains. Since that time more than 500 connections have been made with our sewers under city supervision.

STREETS.

During the past four years some 19 new streets, or extension of existing streets, have been opened for public travel, with an aggregate length of about two miles, making the total length of streets within city limits of 38 miles.

The estimated length of roads in the town outside the city limits is 75 miles, of which Dunham street and a new street at Taftville have been built recently.

SIDEWALKS.

In order that there may be uniformity and that streets and gutters may be so arranged as to properly dispose of surface water, the charter gives the Common Council the right to establish grades of sidewalks. These are usually established only on petition of residents, when they are about to pave walks or make other improvements. Hence the number and amount of walk grades established furnishes some indication of activity and progress.

During the life of this Board 28 sidewalk grades have been established, aggregating a length of nearly three miles. We are justly reputed to have on the whole very much better sidewalks than other cities of our size.

NORWICH—*Charles E. Chandler, City Engineer*, Reporter.

SEWERS.

We had at the end of last fiscal year about 12¾ miles of sewers. Ordinary extensions aggregating about ¾ of a mile have been built the present season, making a total of 13½ miles. These extensions for the most part were suggested by the City Health Committee in localities where the premises generally were sewered into small streams, or onto the surface of unused land.

WATER SUPPLY.

Our reservoir reached its lowest point this season, Oct. 13 to 19, when it was just 8 feet below level of overflow, being higher by over 4 feet than it was last year at same date. It reached its lowest point (12′ 3″) in the history of the works last year, and by a singular coincidence the lowest level occurred Oct. 17, 1890, or practically at same date as lowest point of this season.

It is now down only 6 feet 7 inches and rising.

The fact that we had a plentiful supply of good water for all purposes this season, we consider a cause for congratulation.

OXFORD—*Elijah B. Treat, Clerk,* Reporter.

There have been no special meetings of the Board necessary. A few dead carcasses lying exposed were ordered buried.

The town has been quite free from contagious diseases.

The Health Officer gave notice of a case of scarlet fever to the neighbors and consequently none of the children took it.

PLAINFIELD— *William I. Hyde, Clerk,* Reporter.

Early in the summer, the drainage of two quite extensive areas in the village of Moosup were ordered by the Committee, which was done by the owners of the property, thereby freeing those living in the vicinity from the foul stenches arising therefrom.

I have examined places in reference to sanitary conditions and find a few faulty, especially in regard to sink drains.

Physicians have not reported to the Board any cases of contagious diseases.

PLYMOUTH—*Jason C. Fenn, Clerk,* Reporter.

The Board of Health consisted of those who were familiar with its duties. No epidemic has visited us. One case of scarlet fever was reported and quarantined, but was one of mild form.

That part of the town known as Terryville has been blessed with a public water supply from the best of spring water, free from all contamination, thanks to Dr. Wm. P. Swett and Richard Baldwin, who have made the undertaking, believing that good water is and always will be appreciated. The principal streets of the village have been piped, and already the public show their appreciation of a water supply, which stands the test of the past year.

As yet no steps have been taken towards public sewers.

Quarantine notices and other printed matter is kept on hand in case there is a demand for it.

The work has been gratuitous and the $200 appropriated for the use of the Board has not been drawn upon.

PORTLAND—*C. A. Sears, M.D., Clerk,* Reporter.

There has not been much done by the Board this last year; a few pig pens ordered removed or cleaned out. One sink drain nuisance was ordered remedied.

A new sewer has been put in Airline avenue, Fairview and North Main streets. We have a fine reservoir about four miles from the village; clear and pure water, so much so that neighboring city Middletown would like to connect onto it. There has been very little typhoid fever the past year. Scarlet fever prevailed to quite an extent last spring, some very severe cases. There have been several cases of malignant diphtheria the past two months; none now.

PRESTON—*Hugh King, Clerk,* Reporter.

Owing to the thorough work of the Board of Health during the previous year there was cause for only a few complaints, and these were about the filthy condition of some cesspools and privy vaults, and in every case the owners were prompt in complying with the requests of the Board of health.

There were no undertakings in the town affecting public hygiene during the year.

The water supply is excellent.

SIMSBURY—*A. S. Chapman, Clerk,* Reporter.

Don't know of anything special to report. Don't know of any undertakings affecting public health.

Simsbury's water company have extended their works, which will give those that use it purer water.

SO. MANCHESTER.

The following information in relation to the South Manchester Water Supply is in response to an inquiry of the local board of health about it:

MR. B. F. T. JENNEY, *Sec'y Board of Health, Manchester, Conn.:*

DEAR SIR:—Replying to your request for information in regard to the water supply and sewerage of South Manchester:

The water supply is by gravity from a reservoir, 3½ miles from the silk mills, giving a head of 240 feet at that point. The distribution is by means of a 12″ iron main to the village, and iron

laterals from 4″ to 10″. The head over the village is from 150 to 250 feet. The reservoir has a capacity of 35,000,000 gallons, and covers 7.3 acres. The greatest depth is 30 feet; the least depth 4 feet, and the average 13.3 feet. The reservoir is formed by an earth and stone dam, 620 feet long, of very ample proportions, the entire water face being riprapped with stone. All soil, roots, swampy and boggy land was removed from the reservoir bottom, leaving gravel or rock exposed over the entire surface. The earth thus removed was formed into a bank around the reservoir, the top of which is 3 feet above the flow line, and extending from 4 to 20 feet below the water surface. The inner face of this bank was dressed to uniform slope and riprapped with stone, thus forming practically a complete stone basin. The water supplied is obtained from springs and from two brooks fed largely by springs. The brooks drain a watershed of about 3 square miles, the sides of which are made up of steep wooded hillsides, with rock near the surface and frequently cropping out, making what is called a quick shed. There are very few houses in the watershed, and these are far removed from the streams. As would appear from these conditions, the water is very pure. No expense has been spared by the builders to make the works a model of the kind, not only in the cleanliness of the supply and reservoir, but in all other respects.

The sewerage system is now in process of construction upon the plans approved by the Connecticut State Board of Health in July, '91. This plan contemplates disposal by irrigation and downward intermittent filtration, on a tract of land lying three miles from the village, far removed from habitations and also distant from any stream. The soil is exceedingly well adapted to this plan, there being about 6 inches of sandy loam overlying a stratum of sand; the subsoil being a loose gravel, and requiring, it is thought, no under drainage. Ample area can be secured. The sewage is to be carried to the fields by a main sewer intercepting the laterals already laid. The main sewer is now in course of construction, and is completed to a storm overflow discharging into the stream below the village. The sewage will be discharged through this overflow for the winter and until the main sewer is completed. Yours truly,

CHENEY BROTHERS.

Nov. 11, 1891.

STAFFORD SPRINGS—*Geo. C. Parkers, Clerk of Borough,* Reporter.

During the year we have constructed three new sewers on different streets of the borough. These sewers directly conduce to the improvement of the public health. The abundant supply of pure water from the water works, put in two or three years ago, has also, it is believed, conduced to the same end, and largely benefited the public health. I might say that contagious diseases, like typhoid fever, etc., in the localities benefited by the water works and sewers are almost unknown.

STAMFORD—*Geo. Baker, Clerk,* Reporter.

East Park avenue, West Park avenue and Garden street have been sewered this year, and it has been voted by the Stamford Board of Warden and Burgesses to fill in the old canal—so long a menace to the health of the town, located as it is, very near the business center.

Besides the usual sanitary regulations commonly adopted, the borough has enacted the following very important ones :

REGULATION 16. There shall be appointed by the Board of Health a sanitary inspector, who shall assist the Health Officer and perform such duties and services as may from time to time be prescribed by them for the preservation of the public health. His compensation shall be not to exceed —— dollars per day when on duty.

REGULATION 17. It shall be the duty of the Sanitary Inspector under the supervision and direction of the Health Officer to make a thorough sanitary inspection of the entire area under the jurisdiction of this Board, at least once in each year and oftener if necessary. Such inspection shall include all matters affecting the public health; and a report of the sanitary conditions disclosed by the inspectors shall be made to this Board, and this Board shall communicate said reports, or the substance of them to the State Board once a year or oftener.

The water supply of Stamford is derived from a water shed adjacent to that of the Croton.

The Board of Trade, desirous of serving the public interest in this matter, had analysis of the Stamford water made by Prof. Chandler, of New York, whose report indicates that the water is perfectly wholesome, and of unusual purity.

STERLING— *W. C. Pike, Clerk*, Reporter.

I have no report to make.

BOROUGH OF STONINGTON—*Charles B. States, Clerk of Board of Health*, Reporter.

This Board has done nothing of special interest during the year 1891.

The usual attention has been paid to the cleaning of water closets and cesspools.

We have no public sewers.

There have been no outbreaks of contagious diseases. No epidemics except the "Grip," and the public health has been above the average of many smaller towns. The situation of the borough has very much to do with the health of its inhabitants, being entirely surrounded by salt water, and swept continually by the winds from the ocean.

We have no fresh water rivers or canals and no stagnant ponds in the borough limits to breed disease.

No sewers have been opened. No new public water supply. No wet lands drained.

As a community we have great cause for thankfulness for freedom from contagious diseases or epidemics, in that we are so favorably situated.

STONINGTON, TOWN—*George D. Stanton, M.D., Clerk*, Reporter.

We have in this town five voting districts with villages in each, and members of Health Committee are appointed for each district, vested with the powers of the full Board. During the past year the labors of the several Committeemen were directed mainly to seeing that cesspools and privy vaults were cleaned out at proper intervals.

The town of Stonington has not suffered from epidemic diseases during the past year, excepting the influenza, ycleped *la grippe*. This distemper made its appearance here in the spring of '90, again last spring, and is prevailing here at present writing. Each succeeding visitation of the disease presents different symptomatic characteristics, and each succeeding one being more intractable to medical treatment. The tendency to pneumonic complications is greater at present than formerly, The present cases are ushered in with less constitutional disturbance than previous ones, but there is greater tendency to delirium, syncope and

sudden collapse. The slight consolidation of the lung—rarely more than one lung being involved—present in fatal cases renders it inexplicable to account for many sudden fatal terminations. A patient may apparently be convalescing finely and express himself as feeling "first rate," when suddenly the temperature drops below the normal point, followed by delirium and rising temperature, then a sudden fatal collapse.

THOMASTON—*F. W. Etheridge, Clerk*, Reporter.

No report was submitted by the Health Officers.

BOROUGH OF WALLINGFORD—*D. C. Porter*, Reporter.

The Court of Burgesses here comprise the Board of Health, and there has nothing been done to better the sanitary condition of the borough. There has been about 600 feet of new sewer laid, that is all. And we have at present partially completed a new water-main from our reservoir to the borough. I think our sanitary condition is in very good shape, but could be improved here as well as other places.

WALLINGFORD, TOWN—*Z. P. Beach, Clerk*, Reporter.

The Town Board of Health has had but little to do. At the time the small-pox was in Meriden, the Town Board in connection with the borough Board of Health prepared a pest house to which any patients could be sent, but fortunately there has been no use for it.

William street has been sewered this autumn, and in respect to sewers I think Wallingford is ahead of most towns of its size. The public water supply is obtained from Paug pond, four miles east of here. This pond is one mile long and one-third of a mile wide, and forty feet deep, and is fed entirely by springs in the bottom. This year the water-main has proved too small and the borough is now laying another main from the same source. This pond is from 150 to 250 feet higher than the borough, so there is enough force to the water for ordinary or fire purposes if the mains are of sufficient size.

WATERBURY—*E. G. Kilduff, City Clerk*, Reporter.

We are putting in new sewers as they are petitioned for and also upon recommendations from the Health Board and Sewer Commissioners. The length of sewers in use January 1, 1892, will

be about twenty-three miles. Total length of streets about forty miles.

Surveys and plans are being made for the disposal of the sewage. This work is being prosecuted under the direction of the City Engineer.

Surveys, plans and investigations for an additional water supply are being made under the direction of Rudolph Herring.

WATERTOWN—*C. L. Mack, Clerk*, Reporter.

Our Board of Health were not called upon the last year, therefore we have no report to make.

WESTBROOK—*D. W. Grosvenor, Clerk*, Reporter.

There has been nothing done here. The sanitary condition of the town is very good. Some rules for the taking care of garbage from the numerous cottages that line our beach have been contemplated, but as yet nothing has been done, but probably in the near future some action will be taken in that direction.

WEST HARTFORD—*F. H. Stadtmueller, Health Officer*, Reporter.

The year just closed has occasioned but little work for the Board of Health, few emergencies having existed demanding immediate attention. These may be briefly classed as follows :

I. Special Nuisances. II. Contagious Diseases.

It is worthy of note, that there are seven cases less under Class II than during the foregoing year.

For cases occurring under Class I, measures were adopted tending to the removal or abeyance of their causes. Under Class II, careful inspection of premises, directions for disinfection, isolation of patient when necessary, and source of contagion, covered the field of action pursued by the Health Officer. One case of typhoid was probably contracted from polluted well on premises, while the source of contagion for three remaining cases could not be satisfactorily established. The one case of diphtheria was brought to town, having been contracted at Rochester, N. Y.

Considerable time has been devoted to perfecting the organization of the work of the Board of Health. This was made possible by two following votes as passed by the Board at its last annual meeting.

"*Voted:* That the Health Officer is hereby instructed to notify all physicians practicing in West Hartford to promptly report all contagious diseases coming under their charge to the Board of Health."

"*Voted:* That the Health Officer is hereby authorized to inspect such property as he may deem necessary and proper, and report condition of same to the Board of Health. Also to purchase such books as are necessary for such work."

Failure, both by physicians and party where cases occurred, to report cases of contagious diseases, caused vexatious and possible serious delays for the discharge of duties devolving upon the Health Officer. To prevent, in a measure, such failures and delays, the first of the foregoing votes was passed. In accordance therewith, the Health Officer sent a copy of the following circular letter and blank postal card to each practicing physician of this town, Hartford and Newington :

BOARD OF HEALTH,
WEST HARTFORD, CONN., 1890.

Dr. ——— ———
——— ———, HARTFORD, CONN.

Dear Sir :—Your attention is respectfully directed to the organization of the West Hartford Board of Health according to the General Statutes of Connecticut, Sections 2588, 2590 and 2293. Under the rules adopted by this Board your attention is especially called to Rule XI, to wit :

"Every physician who shall have prescribed for or attended any person having any of the diseases named in Rule X (viz : small pox, membranous croup, scarlet fever, diphtheria, typhoid fever, typhus fever, Asiatic cholora, or yellow fever), shall forthwith report to the Health Officer of West Hartford, in writing, the name, age, and address of such person, also the school at which he or she attends, or shop or factory in which he works ; and every attending physician shall also report in writing to this Board the name, age, and address of every person who shall have died of any of said infectious diseases, giving the specific name thereof within twelve hours after he shall have been informed thereof, and this report shall be in addition to the certificate of death required for the Registrar; any physician who shall refuse or neglect to make report as herein required within twenty-four hours of the time when he first discovered the nature of the dis-

ease, shall forfeit and pay the penalty prescribed in the General Statutes, Section 2593, to wit: not less than fifteen nor more than one hundred dollars, for disobedience of a legal regulation of this Board."

For convenience of conforming to this rule, you will please find enclosed blank postal cards. These may be obtained at any time by addressing the West Hartford Board of Health, West Hartford, Conn. Yours respectfully,

F. H. STADTMUELLER,
Health Officer.

Following is a copy of blank postal cards addressed to West Hartford Board of Health:

REPORT OF CONTAGIOUS DISEASE.

I hereby notify the Board of Health of the existence, in the town of West Hartford, of a case of contagious disease, as follows:

.... 18
Name of Patient, ...; *Age*......
Residence, ...
Disease, ...
Beginning of illness,..18
Sanitary condition of premises.......................................
....*M. D.*

Ninety-four of these circular letters were mailed, the number being unavoidably large, inasmuch as no certain knowledge was obtainable as to which physician from Hartford practiced in town, thus requiring the notification of all Hartford practitioners. The promptness of returns now made causes great satisfaction, and justifies the wisdom of the action leading thereto.

In the discharge of his duties and from general observation the Health Officer was impressed by the comparative small number of people who understand the principles of sanitation, and as a consequence of such a status, the unsanitary surroundings generally prevalent where visits and inspections have been made. These conditions in connection with the knowledge of the functions of the Board of Health, brought vividly to mind the value of a report such as was provided for by the second vote previously recorded. This vote is designed to ensure an inspection of every residence in town, as to general sanitary condition, and in detail as to wells, water supplies, drains, cesspools, vaults, and disposition of sewage. At the same time the nature of the soil and slope of land adjoining premises are to be recorded. Such

information is to be carefully tabulated and published from time to time, according as sufficient data have been obtained. The importance of such a task, both as an educator for the people and an aid to the Board in the discharge of its duties cannot be estimated.

It is to be sincerely regretted that such a report could not be made this year. Unavoidable circumstances seriously interfered with the progression of the work, and sufficient material is wanting upon which to make any detailed comments. However, numerous inspections have been made, all of which corroborate the suspected need of such a report and its importance.

WETHERSFIELD—*Horace Robbins, Clerk*, Reporter.

The Board of Health for the town of Wethersfield has not had any complaints for the year 1891. No new public sewers.

WILLIMANTIC—*Thomas J. Kelley, Clerk*, Reporter.

The Town Board of Health has nothing to report. The Board of Health of the borough of Willmantic is an active and efficient body, and have within their jurisdiction three-fourths of the inhabitants of the town and practically all of the thickly settled portion. So that little remains for us to do.

BOROUGH OF WINSTED—*E. A. Nellis, Warden*, Reporter.

For the last two years there has been nothing done in this place in the way of water improvement, no sewers laid, and no low land drained. During that time there has been no epidemic or virulent disease in this section.

WOODBRIDGE—*Marcus E. Baldwin, Clerk*, Reporter.

Nothing has seemed necessary to be done by the Board of Health during the last year. No report has been made.

The preceding reports indicate a good degree of activity among the local Boards of Health.

Two-thirds of them make mention of good work done and a wholesome influence prevailing.

There are, however, still too many Boards whose functions are dormant until aroused into activity by the indignant complaints of some of their suffering fellow townsmen. But their numbers are slowly diminishing.

The new enterprises in regard to comprehensive methods of sewage disposal, and the intelligent efforts to secure a good water supply in so many different towns, are all indicative of sanitary progress, and of an enlightened acquaintance with the general principles of, and a growing interest in, public hygiene.

It is a reading age, and the citizens of Connecticut are a reading people. Journalistic literature in almost all departments is alive to the importance of public sanitation ; and the daily press has done a work, the value of which cannot be estimated, in keeping public attention to the subject, by printing freely from the sanitary publications articles of interest and instruction on the many interesting topics relating to the public health.

The press as a whole, with great unanimity and constancy have very materially promoted the efforts of the State and local Boards of Health in educating the public mind on hygienic questions and promoting sanitary enterprises.

The practice of public hygiene must follow and accord with the public intelligence. It cannot lead it. If the progress is therefore slow it is also sure and permanent.

SANITARY REGULATIONS ADOPTED BY LOCAL BOARDS OF HEALTH.

The State Board has received copies of sanitary regulations which have been adopted by local Boards of Health in the following towns. In almost all of the said towns enumerated, the regulations require the prompt notification of contagious and infectious diseases.

Barkhamsted, Bridgeport, Brooklyn, Burlington, Canaan, Chatham, Colebrook, Danbury, East Hartford, East Windsor, Enfield, Farmington, Glastonbury, Greenwich, Griswold, Groton, Guilford, Hartford, Madison, Manchester, Naugatuck, New Canaan, New Hartford, New Haven, Norwalk, Orange, Plymouth, Putnam, Rocky Hill, Rockville, Stamford, town and borough, Thomaston, Thompson, Torrington, Waterbury, Westport, West Hartford, Windsor Locks.

There may be still other towns with similar laws which have not reported to this office.

There should be one additional regulation to supplement the one relating to notification of contagious diseases, and that should distinctly specify the duties of the Health Officer when notification is received.

SECRETARY'S REPORT.

By C. A. LINDSLEY, M.D.

Secretary's Report.

In sketching an outline of the work of the Board during the year 1891, there is very little to be said that has not already been said in previous reports. The most marked difference in the work of the Board during the year as contrasted with former years, is simply its increase.

The correspondence between the State and local Boards is larger than ever before and the interest of the latter in sanitary work is perceptibly improved in many towns. The growth, however, is not so rapid as to indicate any danger of a precocious development; on the contrary, it is unquestionably slow. But it is growth, and it is a healthy growth, and is yielding fruit. The annual reports of the local Boards indicate life and action, and in some instances a vigorous vitality which promises much for the future.

The State Board through its executive officer is consulted more frequently than ever before on matters pertaining to local sanitary questions. In many instances correspondence by mail has been the means of rendering valuable service ; in other cases a visit to the locality by the Secretary, and in some instances the members of the Board or a majority of them have made visits to various parts of the State.

Abatement of local nuisances ; pollution of streams ; public water supply and disposal of sewage by a general sewage system have been the most frequent subjects upon which the advice of the Board has been sought.

Enquiries have been made quite frequently in regard to the details in the restriction and prevention of the spread of contagious diseases. What disinfectants are best, and how to use them? What diseases should exclude pupils from the public schools? How long after convalescence from contagious diseases, should patients be kept secluded? Should children with hereditary syphilis be allowed to go to a public school? or pupils while victims of the "itch?" The Secretary is often asked to give a full and detailed statement of the duties and powers of a Health Officer.

Many legal questions are propounded to the Secretary for solution. Some of them can be readily answered and some are questions which only the courts can decide.

It is only intended in this brief statement to give some general notion of the variety and gravity of the sanitary questions which the Board or its Secretary are called upon to consider and advise about.

The reports printed in the following pages will show in a still more practical way, some of the actual work of the Board.

The following is a report of the Secretary to the authorities at Norwalk, after visiting, by request, and inspecting the conditions of a proposed system of sewers and their outlet.

NEW HAVEN, CONN., February 18, 1891.

To whom it may concern:

By request of his Honor, Wm. B. Reed, Mayor of South Norwalk, communicated through the City Attorney, Mr. John H. Light, I visited South Norwalk on Saturday, February 14th. The purpose of my visit was to inspect the location and surroundings of a proposed outlet of a new system of sewers to be built on the southerly side of the city, and to give an opinion as to whether or not the discharge of sewage at that place would become a nuisance and dangerous to the public health. I was conducted to the site of the proposed outlet by Mr. J. H. Light, and Chas. H. Wood, who explained to me the physical conditions of the place in regard to the grade of surface, the height of water at high and low tide, and the average size of the fresh water stream passing the point.

The location at which the sewer would terminate was at the side of a small creek through which a small sluggish stream of fresh water flowed at low tide.

On account of the very slight grade, this point was nearly the extreme limit to which the sewage could be carried by gravity.

At high tide I was informed that the low, marshy grounds on either side of the creek, were often overflowed. These grounds were of many acres in extent and the highlands near them were sparsely occupied by dwellings.

Two prominent considerations demand attention in forming an opinion on the sanitary effect of such conditions.

1st. What will become of the sewage after its discharge from the sewer?

2d. Is the amount of sewage to be discharged at this point so insignificantly small as to render the first question unimportant.

Let us take up the latter enquiry first. How much sewage may be expected to be delivered at this outlet of the proposed sewer?

Mr. Wood has informed me that the district served by the proposed new section of sewers is now inhabited by about 240 persons living in forty-seven houses.

In the report of the Rivers Pollution Commission to the English Parliament, made in 1870, it is stated : That taking a population as a whole, living together, each individual contributes to the general mass of sewage, in the form of excreta from the person, a little more than 1,000 pounds per year, that is in the form of feces and urine, and that the refuse from manufactories, markets, slaughter houses, stables, laundries, baths and animal refuse of all kinds, is about equal in amount to the human sewage.

If this estimate is correct, there will be discharged at this outlet every year 2,000 lbs., or one ton of filth from every person living in the district. This will of course be increased in bulk and weight by whatever amount of water is used to dilute it and float it through the sewers.

The present population of the new sewer district being 240, it will furnish annually 240 tons of pure sewage, with the additional water necessary to carry it, and which upon admixture immediately becomes sewage also, to be discharged into this creek.

In undertaking, however, permanent improvements of this kind, it is always approved good judgment to have regard for the future. This section of the city is rapidly growing—its growth will be stimulated still more by the advantages of sewers. In time the population may be four or five times its present number, with a thousand tons of sewage to be poured into this little creek every year. It is therefore quite evident, that the amount of sewage discharged at this sewer outlet makes the question : What will become of it? an important one, and that this question will evidently grow in importance every year.

What then will become of the sewage delivered at this new outlet?

It is to be discharged into a small creek where sometimes the current of water will carry it in one direction and sometimes in the other, as the tide flows in or out.

If it was discharged into a rapidly running stream of water by which it would be carried at once, before decomposition could occur, directly into the deep water of Long Island Sound, there could be no objection, in a sanitary sense, to such disposal of it.

As it is, a limited portion of the daily discharge no doubt will be carried out to sea, but the tides will play shuttle-cock with the greater part of it carrying it up and down the creek and spreading a good portion of it over the surface of its banks and of the flat marshes adjacent.

And it is still a more unfavorable place of discharge because the relations of salt water to the bacteria of decomposition are such that its purification will be very much slower than it would be in fresh water ; the sewage remaining longer in a decomposing condition and giving off into the air the resulting offensive effluvia.

I have, therefore, no doubt that the discharge of as much sewage as is proposed at the place shown to me, on Saturday last, would soon become a nuisance so intolerable that the public safety would demand its abatement.

All of which is respectfully submitted,

C. A. LINDSLEY, *Secretary.*

P. S.—Since writing the above I have received another communication from Mr. Wood, in which he suggests that by adopting the "separate system" he will be enabled to discharge the sewage "some three or four hundred feet below the bridge, and possibly one or two hundred feet out from high water mark."

If that is practicable it will certainly diminish if not wholly remove the objections to the plan first proposed.

But I would beg leave to suggest that it would be worth while to test the action of the tides at this new proposed outlet by using floats and observing where they are carried.

C. A. L.

The following report made to the managers of the "Temporary Home," in Tolland County, relates to an epidemic of scarlet fever among the children.

NEW HAVEN, CONN., March 7, 1891.

Mr. M. P. J. Walker, Chairman of Board of County Commissioners, etc.

SIR:—Having this day visited the Tolland County "Home," at your request, to advise with you in regard what sanitary precautions should be taken, in view of the present outbreak of scarlet fever among your children, I beg leave to submit as a supplement to the verbal advice then given, the following brief summary.

Your situation is such, that without doubt, all the present inmates of the "Home" have been fully exposed to the infection, and such of them as are not exempt, by reason of having already had the disease, will probably soon be ill with it.

Whatever precautions, therefore, are considered, will have reference chiefly to the disinfection of the house and its contents, to make it safe to receive new-comers. At present the most you can do is, to avoid any further infection of such parts of the house as have not been exposed. Keep the convalescing patients, as well as those now sick, separate from the others, and all things with which they may have been brought in contact.

Those who have immediate care of the patients should, if practicable, be restricted to those parts of the house to which the patients are restricted.

You might also with advantage begin to reduce the amount of infected things. For instance: In the large room at the top of the house where the sick children are lying, there are upon the wall and scattered about upon the benches, a large amount of colored prints, books, papers, toys, etc. These are of little money value, and not worth the trouble of disinfection. They should all be burned forthwith. Their removal should be managed as follows: Take a large bag, saturate it in standard solution No. 2. Simply wring it out, and use the wet bag to carry the things in, down stairs to an open fire place or better, make a bonfire of them out of doors. While doing this pick up everything else in the house which is valueless and destroy by fire.

After the recovery of all the patients, and after the skin-shedding is completed, then the work of fumigation and disinfection should be undertaken for the whole house. I would, however, earnestly advise that at short intervals, the rooms now occupied by the sick and recovering children, should have the floors and all the wood-work wiped over with a cloth dampened with the corros. sublimate solution, No. 2. This destroys the infection already lodged there, and prevents so great accumulation of it.

In regard to the final disinfection, the circulars I sent you give you full instructions. I only wish to emphasize the necessity of being thorough. Remembering that a partial disinfection is no disinfection at all. If you leave only a *little* seed, when you have new comers, you will get a new crop of fever, and all the work to do again.

Now a word about providing for such an emergency in the future. Your house is admirably contrived for such exigencies. There could be no better place than the large room in the top of it for a hospital. It is defective, however, in one very essential point. A most indispensable requisite for a hospital is sufficient ventilation. The ventilation of that room is very *bad* indeed. It would be greatly improved if there was a fire-place in each end of it with open wood fires. If fire-places cannot be built, the next best thing would be large open Franklin stoves for wood fires. It is very desirable to put in such stoves immediately for the good of the present patients. Then if you would make the place almost an ideal hospital room, you have only to put dormer windows on each side of the room, through the roof, and you would have the best hospital accommodations of any Home in the State.

I think you ought to consider the advisability of devoting that room to hospital uses, fitting it up specially for the purpose and keeping it always ready for such uses.

In times of health it may also be used as a play-room for the children, but not for the *storage* of anything not needed for the sick.

I most heartily congratulate you, that among so many victims of the fever, you have thus far lost none by death. It is very significant of good nursing and skillful medical care.

Very respectfully,

C. A. LINDSLEY.

The following correspondence explains itself.

MYSTIC, CONN., April 24, 1891.

Prof. Lindsley, Secretary Connecticut State Board of Health :

DEAR SIR :—The work of dredging Mystic river has been commenced. A wharf owner is negotiating with the contractors to have a large quantity of the black mud from the bottom of the river dumped upon his wharf and premises in the center of this village, to be used, as he says, to build out and extend his land to the southward. In the estimation of your Board would the exposure of a considerable surface of said mud to the influence of the sun and evaporation be dangerous to pub-

lic health. If so, please inform me at once, as the work of making such a deposit in said place will probably commence soon, if at all.

Yours truly,

L. M. GUERNSEY,

Health Officer, First District, Mystic Board of Health.

NEW HAVEN, CONN., April 25th, 1891.

To L. M. Guernsey, Health Officer of Mystic Board of Health:

DEAR SIR:—Your favor of the 24th, is received. In answer to your question would say that I do not know of any evidence that it would prove detrimental to the public health. The mud deposits at the bottom of rivers is not of uniform composition. It contains in most instances more or less organic matter, but this on exposure to the sun and air would soon be oxidized and if there was any offense from it, it would be but temporary.

The probability is that the risk to health would be no greater than filling up the same space with soil obained from other sources.

Very respectfully,

C. A. LINDSLEY, *Secretary.*

About the first of May, the Secretary received from Dr. L. S. Paddock, a member of the Board of Health of Norwich, a request to visit that place to advise with certain philanthropic parties who are about to establish a public hospital for the city, in regard to the disposal of the sewage from the institution.

In response to this request the Secretary subsequently visited Norwich, and after making a careful inspection of the proposed site of the hospital and its surroundings submitted the following report:

To the Board of Health of Norwich:

On the request of Dr. L. S. Paddock, one of the members of your Board, I visited your city on the 20th day of May.

In company with the Doctor and Mr. J. S. Lathrop, I was shown the site of the proposed new hospital. It is a situation well chosen in the center of a plateau of several acres in extent, so well elevated as to have a commanding view of the surroundiug vicinity and unobstructed ventilation.

The numerous well-grown shade trees upon the grounds will not only add to the attractions of the place, but contribute largely to the comfort of the patients, and enhance the salubrity of the location.

My opinion was requested, as representing the State Board of Health, in regard to the disposal of sewage from the Hospital, and especially, if from a sanitary point of view, there would be any objection to discharging it into Yantic river, which passes the place on the westerly side.

In considering the question, the prime points are, the amount of sewage, the amount of running water, the rapidity of the current, the ultimate disposition of the sewage after it enters the river, and finally the subsequent uses of the river water with reference to such pollution.

The quantity of sewage in one sense is represented by the amount of water used from a public supply. The water received being a close measurement of the sewage to be disposed of.

But careful estimates have been made of the amount of undiluted sewage produced per capita in a mixed community. In the Report of the Rivers Pollution Commission to the English Parliament made in 1870, it is stated, that taking a population as a whole, living together, each individual contributes to the general mass of sewage in the form of excreta from the person a little more than 1,000 pounds per year, that is in feces and urine, and it estimates that other sources of refuse as factories, markets, stables, kitchens, laundries, baths and the excreta of domestic animals would be fully equal to the human sewage. Each person then would represent 2,000 lbs., or one ton of sewage per year.

Therefore it follows, that if the Hospital gives shelter to 100 inmates, they will produce every year 100 tons of undiluted sewage, one half of which will be human feces and urine.

This, with the water necessary to carry it to the river, would be sufficient to very sensibly pollute a large stream and render it wholly unsafe for any domestic uses whatever. It would no longer be wholesome as a place for watering cattle, or a cleanly place for bathing, nor would its waters be suitable for laundry uses, and most decidedly unfit as a source of ice supply.

I do not know that the waters of the Yantic are used at all for any such purposes from your city to its final mingling with Long Island Sound, except that a large ice house stood upon its western bank. If it be the fact that the water of this river has no other use than that of a mill propeller, it only remains to consider the other objections, if any, to such defilement.

I had no means of measuring the amount of flowage at the time of my inspection, and could only observe, that at the probable point of discharge, the current was rapid and full, ensuring, if it was always in that condition, the speedy transmission of the sewage while still fresh to the body of water held back by the dam below.

During certain hours of the day the flow here is arrested, and the sewage would find a more or less permanent place in several ways. A portion of it would be carried by gravity to the bottom, as in a settling tank, another portion would float and of this some would be wafted to the banks and adhere to whatever it might come in contact with, and still another and perhaps greater portion would be carried on in the flowing current. The arrest of the stream by the dam at a point so near where the sewage is received, is a serious objection to this mode of disposal.

Were it not so, the great bulk of the sewage would be carried bodily over the falls and still onward to be yet more diluted by the larger waters below.

The conditions are unfavorable in another way; the inequalities of the river bottom and the frequent fluctuations in the amount of water, causing considerable surfaces to be alternately exposed and covered, thus favoring, I think, greater deposits of sewage from the receding waters to producing unwholesome emanations from its decomposition.

This is a point entitled to more consideration, from the fact that in this instance the sewage is derived from a hospital and will often be the bearer of disease-producing germs.

Notwithstanding all these objections, it is my belief that if the water of the river was uniformly as full as when I saw it, the limited amount of sewage entering it would be so much diluted that for several years this mode of disposal may be employed without danger to the public health. And on the other hand, I have little doubt that while it would not immediately be productive of bad results, it will be eventually, if persisted in.

Having thus answered the more direct enquiry upon which my opinion was asked, I venture to offer a suggestion as to another mode of sewage disposal, which, from what I saw of the situation of the proposed hospital, I believe would be entirely practicable.

I have reference to the purification of the sewage by land irrigation and the subsequent discharge of the purified effluent (if there is any) into the river.

The favorable character of the soil about the Hospital, its elevated situation allowing the most complete drainage, and the abundant area of surface present facilities for this mode of disposal not often found.

If the special form known as the "sub-surface irrigation" is adopted, it would economize the fertilizing properties of the sewage and so in some degree return the cost of its adoption.

Before committing yourselves to this plan, however, I would most emphatically urge you to consult some competent *Sanitary Engineer* who has had experience in this kind of work. Such men as Gray of Providence, Waring of Newport, Hering of New York, Bassett of Newark, or McKenzie of our own State, would any of them be competent to give you sound and trustworthy advice, and to superintend the work if it is undertaken.

Whatever you do, if you attempt this mode of disposal, trust it to no one who has not had a practical acquaintance with this special engineering work. The details necessary to its success are only to be obtained by personal experience.

Of course this mode of disposal provides only for the sewage. All roof water and other storm water should be provided for separately.

In support of the above recommendation, I may be permitted to quote the following from the work of W. Santo Crimp on "Sewage Disposal Works," who is one of the most recent and best authorities on the subject. He says: "In summarizing the conclusions and recommendations of the various Commissions and Committees who have investigated the subject of sewage disposal on different occasions, in this and in other countries, during the past thirty years, it will be observed that perfect unanimity obtains in regard to the purification of sewage by means of land."

All of which is respectfully submitted,

C. A. LINDSLEY, M.D.,
Secretary of State Board of Health.

The following relates to the sewage disposal of Meriden:

MERIDEN, CONN., Aug. 8, 1891.

Dr. C. A. Lindsley, Esq.:

DEAR SIR:—A special committee appointed by the Mayor has been investigating the question of a sewage system for our city and is about to report. They will recommend the irrigation plan and have selected a site which seems to be suitable. We should like the opinion of the State Board of Health and would name Friday the 14th as the day (afternoon if possible).

Will you please advise me by return mail if you can favor us. have spo ken to Dr. Wilson, who can be present. I also have to notify an engineer in Boston, whom we want to be here.

Your attention will oblige, Yours,

HOMER A. CURTISS,
Chairman Special Sewer Committee.

The State Board, in response to the request, visited Meriden at the time specified and subsequently made to the committee the following report:

NEW HAVEN, CONN.

To the Committee on Sewers of Meriden:

The State Board of Health held a special meeting at Meriden on Friday, August 14th, in response to a request to advise with the Committee on Sewers in regard to certain plans proposed for the disposal of the sewage of the city.

After examining the drawings and hearing the explanations of the Civil Engineer, Mr. McKenzie, the Board was shown over the proposed line of the trunk sewer to a broad, flat field some three miles distant from the Meriden depot, which field it was proposed to utilize for the purification of the sewage by broad irrigation.

Excavations had been made in the ground in several places to determine the character of the soil, with reference to its fitness for such a purpose.

The Board was assured by the Engineer that there were no difficulties to overcome in carrying the sewage to this place by gravity.

The amount of land available and favorably situated is abundant to meet the requirements of the city for generations to come. The quality of the soil is such as, in the opinion of the Board, is best adapted to accomplish the object in view.

A few inches of the surface is a light loam, with substrata of gravel and fine sand for many feet in depth. While the surface of this plain is lower than the city, it is still elevated some 20 feet above the stream which flows beside it or through it. And the ground is believed to be so porous and so well drained by this stream as to render unnecessary any expense for artificial sub-drainage.

The location is unexceptionable in every respect, being so distant from the city and so remote from any human habitations, that it will not, if cared for as it should be, result in a nuisance to anyone.

The State Board of Health gives its full approval of the method of disposal proposed by the plans of the Engineer, and of the plan of disposal.

Per order of the Board,

C. A. LINDSLEY, *Secretary.*

As being the largest undertaking to dispose of sewage in Connecticut, by the method known as "broad irrigation," the following reports on the subject by sanitary engineers and others are thought worthy of publication.

COMMITTEE'S REPORT.

MERIDEN, CONN., Sept. 9, 1891.

To the Honorable Court of Common Council:

The committee appointed to investigate the matter of sewerage beg leave to report that recognizing the fact that the time has come when Meriden must face the important question, we have given the matter our careful attention. We have been in correspondence with prominent engineers and have visited and inspected systems at Worcester and South Framingham, Mass., Cranston, R. I., Orange and Long Branch, N. J., and Pullman, Ill. We have employed T. H. McKenzie and S. C. Heald of Boston, who was Chief Engineer of South Framingham works, to prepare a map, estimates of costs, etc. We herewith present their report, also a communication from the State Board of Health and one from Mr. Carrol Ph. Bassett, one of the most prominent and successful engineers on sewerage in the country.

The conclusions we have reached favor a separate system of sewerage, running the storm and surface waters into the streams, and purifying the sewage on land. We find the best authorities in this and other countries recommend such treatment where suitable land can be obtained.

Circumstances in our city appear peculiarly favorable for such a system, and we unanimously recommend it.

Should the Council approve this report we request that a city meeting be called at an early date to take action upon the question.

All of which is respectfully submitted,

H. A. CURTISS.
J. H. CHAPIN.
AUG. MASCHMEYER.
JAMES T. KANE.
BENJ. C. KENNARD.

ENGINEER M'KENZIE'S REPORT.

MERIDEN, CONN., Aug. 20, 1891.

To the Honorable, the Mayor and Committee on Sewage Disposal of the City of Meriden :

GENTLEMEN :—In response to the invitation contained in the letter from the chairman of your Committee and dated Feb. 20, 1891, I began investigations for the purpose of determining what methods of sewage disposal were feasible for the city of Meriden, and which of the various methods would be most economical and efficient.

The three best known and most commonly practiced methods of disposal are by irrigation, filtration and chemical precipitation. Irrigation and filtration are considered the most economical and satisfactory methods of disposal where sufficient areas of suitable land can be reached by gravity. The large expense incurred in the original construction and the continual expanse of operation caused by the necessity of duplicating labor and machinery renders the chemical precipitation process objectionable, except as a last resort.

Mr. S. C. Heald, C. E., of Boston, Mass., who has traveled extensively in Europe for the purpose of investigating the matter of sewage disposal, has been associated with me in the problems involved in your case.

After making the necessary investigations to determine whether sufficient areas of suitable land could be reached by gravity, we decided to recommend for your adoption the plan as outlined to you in brief on the evening of April 7th last, which was that the city sewage be disposed of by irrigation and filtration through land, and that the tract of land known as Fall Plains and lying midway between the villages of Hanover and Yalesville be purchased and laid out as an irrigation farm, and that filter beds be prepared as an auxiliary method of disposal for winter use and to be used at such times as the volume of sewage might be more than was necessary for irrigating the land under cultivation.

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We found the fall from the surface of water in Harbor Brook at East Main street bridge to the average surface of the plains to be seventeen and one-half feet and the distance to the center of the proposed tract 17,500 feet, which would allow of a fall in the main sewer of one foot in one thousand, and bring the grade of the sewer sufficiently above the surface of the ground to facilitate the distribution of sewage; we therefore recommend that the sewage be conveyed to the proposed irrigation farm by gravity.

We found that the character of the soil and the surface slopes of the ground were unusually well adapted to the disposal of sewage in the manner recommended; the surface of the ground for a few inches in depth is a black sandy loam underlaid by a coarse sand and gravel. The ground water line lies about sixteen feet below the surface, so that it is not probable that under-draining would be necessary.

We find the area of land which is available for irrigation purposes east of the road to be about 120 acres; the entire area available on both sides of the road is about 250 acres.

The main sewer would be brought onto the land at a slight elevation above the original surface of the ground and an embankment three and one-half feet in height raised over it for protection against frost; this embankment would form one side of the enclosures proposed to be used for filter beds; brick walls would be constructed on the line of the main sewer at intervals of about 300 feet by closing a gate in the main pipe just beyond the well from which it was proposed to distribute the sewage, the water would rise in the well and be distributed through openings in the side into lateral sewage or into open carriers.

For the distribution of the sewage over the land for such tracts as were to be cultivated, we would recommend the ridge and furrow system, the ridge to be about eight feet wide and the ditches between two and one-half feet wide and two feet deep; the water to be run into ditches at each end from open grips or carriers made of split earthen-ware pipes, the water would be run intermittently into the open ditches to a depth of four or five inches.

On the ridges any varieties of vegetables could be cultivated. The ditches should be worked over with a hoe as often as the vegetables are hoed, or once in ten days; by this method the vegetables do not come into direct contact with the sewage, and in England where such farms are extensively cultivated the vegetables raised on sewage farms are sold in the market at the same price as those raised on other farms.

For irrigating grass land the ground should be leveled off in sections about 300 feet wide and of any length desired. Open carriers of split earthen-ware pipe and slightly elevated above the surface of the ground should be laid along each side of the section and the sewage distributed from notches in the side and allowed to flow over the surface.

The slopes of the ground on the track which we have proposed to utilize are such that the ground could be laid out in very large sections and the cost of grading would be light.

For an illustration of the method herein recommended, I refer you to South Framingham, Mass., Cranston, R. I., Pullman, Ill., and Marlborough, Mass., also Bedford, England, population 27,000, area of land irrigated and cultivated 153 acres, an annual rental $4,640.00 per year is paid for the use of the land. The sewage is pumped to the sewage farm through an eighteen inch cast iron pipe; the average daily quantity of sewage is one million gallons.

Beddington, England, population 73,000, 420 acres of land irrigated and cultivated, sewage flows to the farm by gravitation. The combined system is in use here with no storm overflows. The average daily quantity of sewage is in dry weather three and one half million gallons, in wet weather sixteen to twenty million gallons.

Doncaster, England, population 26,000, area of the farm 264 acres, about half of this is under cultivation. Sewage is pumped to the farm at an elevation of fifty-two feet, through a twenty-one inch cast iron pipe; the average daily flow of sewage is 800,000 gallons.

There are several sewage systems with disposal by irrigation now in process of construction in Massachusetts, also a very large number in operation in England, France and Germany. In places where the separate system of sewers has been adopted the volume of sewage is found to be about equal to the water supply, which in European cities is about forty gallons per day per head; while in American cities it usually exceeds 100 gallons per day per head.

For the purpose of determining the size of your main sewer, I have estimated the sewage at about 100 gallons per day per head for 27,000 people and that the flow during the ten business hours of the day would be nearly doubled, or at the rate of about four million gallons per day. I have also allowed for a growth of 100 per cent., or a population of 54,000 people and at the rate of eight million gallons per day of sewage, the capacity of a thirty-six inch sewer when running full on the grade proposed, is about 12,000,000 gallons per day, so that a thirty-six inch main sewer is probably of ample capacity for many years to come.

The entire sewage of the city would not be concentrated into one sewer until the junction was reached at Andrews' mill.

The plans for the sewering of the city which were made in 1875–1878 by myself under the direction of Mr. E. S. Chesbrough, would be utilized in planning the system as proposed. The sizes should be reduced and some of the grades along Hanover street and Cook avenue should be re-adjusted to meet the present grades of the main sewer.

I have estimated on circular sewers for the reason that we would not have a sufficient depth at some points to cover an oval sewer. A flat invert and circular top sewer might be substituted to advantage on Hanover street. Where sewers are of a large size and flow nearly uniform, the circular form is preferable.

The following is an estimate of the cost of the proposed main sewers together with the land for an irrigation farm and the grading of the same:

6,300 ft. of 30 in. circular sewer, Main street to Andrews' mill, at $3 50	$22,050 00
3,400 ft. of 24 in. pipe sewer, West Side to Andrews' mill, at $2 50	8,500 00
6,300 ft. of 36 in. circular sewer, Andrews' mill to syphon, at $4 25	26,775 00
850 ft. of 20 in. cast iron pipe, syphon, at $3 50	2,975 00
1,050 ft. of 36 in. circular sewer, west of river, at $4 25	4,462 50
1,500 ft. 20 in. circular pipe, west of river, at $1	3,000 00
2,000 ft. of 12 in. circular pipe, west of river, at $1	2,000 00
60 wells and manholes at $50	3,000 00
Right of way	8,000 00
Truss over river at Andrews' mill	1,500 00
230 acres of land at an average of $40 per acre	9,200 00
Grading 50 acres at $100	5,000 00
Incidentals	15,000 00
	$111,462 50
Engineering, superintendence, inspection and legal expenses 15 per cent.	16,719 37
Total estimate	$128,181 87

In the above estimate but one line of twenty-inch syphon is provided for and one line of pipe through the land irrigated; these would be duplicated whenever the system was sufficiently developed to demand it.

The cost of sewering the city would average about $7,500.00 per mile, about two-thirds of this cost would be assessed on the property abutting on the streets sewered.

The location of disposal works and method of disposal herein described is the same as outlined by Mr. S. C. Heald and myself at the meeting of your Committee on April 7th last.

Since that time at your request I have made surveys for the purpose of locating the line of the main sewer from Harbor Brook on East Main street and from the railroad bridge on West Main street to the proposed irrigation farm below Hanover.

The location of the main sewer for considerable distance is through private property, but for most of the distance where the line follows along parallel with the Hanover road the location is about 200 feet westerly of the road where a proper depth of cutting is secured and the line would lie in the rear of buildings. From Cook avenue to Andrews' mill it might be advisable to lay out a highway over the route of the sewer. From Andrews' mill to Hanover a profile has been made both over the highway and over the line west of highway. The cost of right of way over private property should be ascertained and borings made along the highway to ascertain the character of the material to be encountered in the deep cuttings. If the investigation should determine that it was not probable that the line over the highway would cost to exceed fifteen per cent. more than the line through private property, I would advise its adoption.

In conclusion, I will say that it is very rare that such a combination of natural advantages can be found for disposal of sewage on land as exists in your case.

The area of land is ample, the natural slopes cannot be much improved, the soil is the best that can be found for the purpose and the location is easily reached by gravity.

I would recommend that the city purchase the land on both sides of the Hanover road from the foot hills on the west to the river on the east. I have provided for in my estimates, and that the land be graded and prepared as required for the proper disposal of the city sewage.

Mr. S. C. Heald, C. E., submits herewith a supplementary report.

Respectfully submitted,

T. H. McKenzie, C. E.

Engineer Heald's Opinion.

Boston, Mass., August 27, 1891.

T. H. McKenzie, C. E.

Dear Sir:—I have received your report to the Honorable Mayor and Committee on Sewage Disposal, for the city of Meriden, Conn., and have examined the accompanying plan and profile of the proposed main sewer from the city to Fall Plains.

If suitable land could not be obtained, or if the expense of reaching suitable land were excessive, chemical treatment in one form or another would undoubtedly be the best method for the purification of the sewage.

With a fall as indicated on your profile of seventeen and a half feet from the bottom of the proposed sewer, in South Colony street, to the surface of the ground at Fall Plains, and with such suitable land for receiving the sewage, I consider that your plan for disposing of the sewage upon the land—a combination of broad irrigation and intermittent filtration—to be most feasible for the city to adopt.

In this country the principal objection made to land treatment is, that in the winter season, with the surface of the land frozen, the sewage would flow over the land and be discharged in a crude condition into the nearest water course.

This has not been the experience of the towns in this country that have adopted this method of treatment. Neither has it been the experience of Danzig and Berlin, having a winter climate nearly like that of New England.

Danzig, in 1871, commenced to dispose of its sewage upon land. The sewage from one hundred thousand inhabitants is utilized by broad irrigation on an area of about 375 acres, or on the basis of 25,000 people to each ninety-four acres. The principal crops raised are wheat, oats, tobacco and a variety of vegetables. A considerabe portion of the farm is devoted to the raising of grass, which proves to be one of the most profitable of crops.

The grass land is leased to farmers in lots of from three to four acres, the farmer having the right to cut the grass for hay or pasture it.

The manager informed me that he experienced no difficulty in caring for the sewage during the winter months; that the temperature of the sewage was warm enough to thaw the frost in the ground, and although ice would quite frequently form on the surface the sewage would flow underneath and the ground be kept from freezing.

Berlin in 1873, decided to adopt this method. The city is divided in twelve radial systems, which are numbered from one to twelve. The sewage from each system is conveyed by gravity to a pumping station and there pumped to the sewage farms, the lift being from seventy to one hundred feet. The sewage from the southerly parts of the city or from systems one, two, three, six, and seven, is pumped to the sewage farms at Osdorf and Grossbeeren, a distance of eight to twelve miles south of the city of Berlin. The sewage from the northerly systems numbers four and five, is conveyed to the Falkenberg farms, about six miles northeast of Berlin. The farms of Osdorf and Grossbeeren have a total area of about 5,500 acres, 4,000 acres of which are devoted to the purification of the sewage from a population of about 500,000. The farm is divided into small fields, the area and shapes of which depend upon the contour of the land, and each field is surrounded by an earth embankment one and one-half feet high. Some of the fields are especially prepared and leveled; others being left with the natural slope of the ground. The greater part of the winter flow of sewage is discharged into some of the level fields, covering them to a depth of from twelve to fifteen inches; some is applied to the fields not especially leveled. The fields that receive the winter flow of sewage are plowed in the spring and sown with grain or a crop of vegetables raised, no sewage being applied to them during the summer. Some of the fields are reserved to receive the sewage that may come during the summer months at such times when not desirable to use it either upon the grass land, or land under cultivation. The fields thus reserved are sown with winter wheat or rye.

The superintendent informed me that he had no trouble in disposing of the sewage during the winter on account of the frost. That he had turned the sewage into fields where the ground was frozen to a depth of twenty-eight inches, and also into fields covered with ice, the result in the first instance being that the sewage was sufficiently warm to thaw the ground, and in the second by cutting holes through the ice the sewage would find its way under and lift it up.

Some of the land owners adjoining the farm at first raised objections to having the sewage farm near their property for fear of odors that might arise, now utilize the sewage upon their own land, paying two dollars per year for each acre receiving sewage and paying all expenses incurred in getting the sewage from the force main to their land.

A portion of the farm devoted to permanent grass is yearly leased at sixteen dollars per year per acre, the city at its own expense furnishing and applying the necessary sewage.

There are many places in England where land treatment has been adopted; and were it not for the excessive cost of the land, about $500

per acre being paid in most instances, many more sewage farms would be in operation there.

Land is a natural filter, and when sewage is distributed over a large area of it, the fertilizing ingredients of the sewage utilized so as to produce the greatest return in marketable crops consistent with suitable purification of the sewage, the application is known as broad irrigation.

When the sewage is applied intermittently in as great a volume as can be properly absorbed and purified by the land used, and while not necessarily excluding vegetation, yet making a secondary consideration to purification of the sewage, the process is known as intermittent filtration.

The soil of Fall Plains is so well adapted for sewage disposal, that I should say one acre would be sufficient to successfully treat by intermittent filtration the sewage of from 300 to 500 inhabitants.

I would advise the city to secure all the available land that lies between contour, elevation seventy-five feet and the river. This will give, as I understand, an area of not less than 260 acres.

Having this area, a portion of it sufficient to treat the sewage by intermittent filtration could be prepared, and the remainder used for the growing of grass or other crops.

In order to secure the most satisfactory results from this method of treating the sewage, a most careful study should be made for the arrangement of filtration areas and the carriers for conveying the sewage.

It may be advisable to have the outlet of the sewers at a slightly higher elevation than shown on profile, in order to obtain the best results in distributing the sewage over the land.

If this should be done a slight change in the grade of the sewer would have to be made.

The fall in the sewer, as you have indicated, is sufficient for any such modification, and would make no change in the general plan you have suggested.

The size of the main should consider ample with the grade you have indicated, and I recommend the adoption of the method you have proposed for the disposal of the sewage.

Yours very truly,

SIMPSON C. HEALD.

THE OPINION OF ENGINEER C. P. BASSETT.

NEWARK, September 7, 1891.

Special Committee on Sewerage, Meriden, Conn.:

GENTLEMEN:—In response to your request under date of August 20 last I visited your city on August 27, and again on September 5, to confer with you and advise regarding proper collection and disposition of the city's sewage. My investigations have included the trend of natural drainage of the city; inspection of land along the city's main drainage valley suitable for sewage purification, notably at Fall Plains; and the surveys and preliminary plans of Mr. T. H. McKenzie, devised under your direction to provide a system of sewerage in your city.

The problem before you naturally separates itself in my mind under the following heads :—What is sewerage to accomplish? Where and how is the sewage to be conducted? To what treatment must the sewage be subjected? And what is the cost?

I will endeavor briefly to reply to these questions with a due regard to the plans before you.

The premises on which the problems rest may be stated as follows: Area of city, 2,300 acres; present population, 27,000, of which perhaps 21,000 is located on 1,300 acres. The average density of population throughout the city is approximately 11.7 per acre; over 1,300 acres the density approximates 16 per acre; water consumed nearly 3,000,000 gallons per day, large quantities of dilute manufacturing wastes to be cared for in the sewers: good natural surface drainage; impossibility of discharging crude sewage in large volume into any adjacent streams, and consequent need of sewage purification; large areas of porous well-drained land distant about three miles from the city available at an elevation about 17 feet below water level in Harbor Brook at East Main street bridge; rather compact sub-soil within the city in some places saturated.

It follows from these premises that were a sewer system constructed in the city at the present time approximately the following volumes will have to be cared for:

Sewage proper	6.0	cu. ft.	per second.
Sub-soil drainage	2.0	"	"
Roof water (estimated roughly)	110.0	"	"
Surface water in excess of roof water	660.0	"	"

But when the population had doubled (reaching 55,000) the flows would become approximately:

Sewage proper	12.73	cu. ft.	per second.
Sub-soil drainage	3.00	"	"
Roof water	250.00	"	"
Surface water in excess of roof water	900.00	"	"

These figures are given to show the relation of the various volumes of flow to be considered. It will thus be seen that a conduit large enough to carry all storm waters would need to be seventy-two times the capacity of one to carry only the sewage proper and sub-soil drainage, and one large enough to carry sewage proper, sub-soil drainage and roof water would be 16.5 times the capacity of one competent to carry sewage proper and sub-soil drainage. Sewage proper is the only flow which it is essential on sanitary grounds should be carried below the city and purified, but any other flows uniting with sewage are contaminated and will require purification. Exception to this principle in times of great dilution from heavy storms and the entire flow turned into adjacent streams.

But from economical considerations it has come to be largely axiomatic in the profession that where sewage requires pumping, purifica-

tion, or long outlet conduits, its volume should be kept at a minimum by excluding storm waters. The latter may be carried where they occasion no inconvenience or damage, in shallow channels to neighboring water courses.

It would be highly extravagant to devise an outlet sewer large enough to carry any large percentage of storm water—extravagant both in the first cost of construction and in the maintenance of any purification process. The concensus of opinion in the profession is altogether in accord with this conclusion.

We can therefore now answer the first question : Sewerage is to accomplish the removal of all sewage proper and in addition such sub-soil water from the deep cuts in the city as are unable to find other discharge into streams. All storm water should be excluded.

To accomplish this purpose a sewer with a capacity of at least 15.7 cubic feet per second, equivalent to 10,173,600 gallons per day must be designed.

Mr. McKenzie has suggested a thirty-six inch circular sewer on a grade of one foot per 1,000 for an outlet below Andrews' mill; above that point he has designed a thirty inch sewer to the east and twenty-four inch to the west, the combined capacity of these sewers on the same grade are about equivalent to the thirty-six inch. The capacity of such a sewer is nearly twenty cubic feet per second (or 12,900,000 gallons per day) giving a surplus capacity of 2,700,000 gallons per day. It is my decided opinion, however, that no less capacity should be provided.

To this end I have recommended, Mr. McKenzie concurring, to lower the thirty inch sewer one foot at Main street and increase its grade to about 1:860, increasing its capacity nearly 100 cubic feet per second and lowering the grade at which house connections and laterals may be received. For the same purpose in actual construction I would advise the modification of the section of this sewer without changing capacity to segmental form with long invert radius. Below Andrews' mill the grade was slightly flattened, sewage being delivered at about 1.0 foot below the level originally proposed, but still high enough to reach the entire area under consideration.

The large amount of right of way across private property may be reduced if it is found that its cost will exceed the deeper cutting in the highways, when negotiations are opened and detail plans made.

The inverted syphon proposed by Mr. McKenzie under the river need give no apprehension, Properly constructed it may be operated without difficulty. The topography is such that an aërial line on abutments and columns might be constructed at a cost not excessive if any popular objection was pressed seriously against it.

The general method of land treatment for the purification of the sewage suggested by Mr. McKenzie meets with my approval. The natural drainage of almost the entire city area is through Harbor Brook, it is therefore essential to avoid pumping, that the sewage be conducted to some point in this valley for purification. It is assumed that some purification of the sewage is an admitted necessity.

The tract selected at Fall Plains is admirably adapted for the purposes of land treatment. No better land could be desired, and the plant which may be there equipped would attract much attention.

I would advise the city to purchase as much as 100 acres of land; there being much more than this available, it would seem probable that a reasonable price only need be paid per acre. Considering the porosity of the land, part of this area could be treated with broad irrigation without under-drainage, part with irrigation after under-drainage and with intermittent filtration after close under-drainage. The latter treatment would purify the largest volume of sewage and as occasion requires, the entire area would be so treated, making it possible to purify the entire sewage of the city for many years to come. It is believed that the successful operation of irrigation works by the city on the plains will create a demand for sewage flow on to similar areas owned by private holders. In this way considerable volume may be disposed of. Such has been the experience in foreign cities.

It should be understood that the process is in no sense experimental or problematical. The results to be secured by it are known by long experience; and few localities have such favorable opportunities to inaugurate sewage purification as has your city.

With such an area of unexceptional land available, no other process of purification should be considered. In no other way could similar results be obtained at anything like the same cost. Efficient purification and economical maintenance may be secured without nuisance and make productive a large area now largely waste.

I have gone over carefully with Mr. McKenzie the cost of the proposed works and the figures now embodied in his report have my approval. Cost of land and right of way are matters on which I am not especially able to pass judgment, but the estimates for construction and allowance for contingencies are ample for any conditions liable to arise.

When construction is determined upon careful analysis of the problems of sewage collections by laterals throughout the city should be made, and the sizes, locations and elevations established.

The detailed location of the outlet mains should also be carefully studied and some changes improving the actual lines now presented, possibly made. Detailed sections, elevations and grades and character of construction should be embodied in well digested plans and specifications before actual contracts are awarded. The work you propose requires careful, accurate, and intelligent consideration at every point. but any changes in the general plan which has been suggested should not be made except to increase the efficiency or reduce the cost of the work now before you. I can commend the plans as projected to the confidence of your people.

Very respectfully submitted,

CARROL PH. BASSETT.

Litchfield Sewers.

In the last annual report of the Board a full statement was made of the proposed method of sewage disposal in Litchfield by land irrigation. It is the first example in Connecticut of the public disposal of sewage by this method. We are now enabled to state that the work has been carried out in accordance with the plans, and the system is in satisfactory operation, so far as completed.

The following is a somewhat detailed statement of the enterprise and the cost thereof, as taken from a Litchfield paper.

"The sewers are now practically completed and a few facts about the work may be of interest to our readers.

"One of the most important items to the property holders is that the sewers were constructed at such a low figure, the total expenditure being under $6,000. It is safe to say that the original estimate of $4,500, would not have been exceeded if the work had been finished according to the plans as first devised. The original plan for these sewers called for their commencement at the parsonage on the west side of North street, and at C. B. Bishop's on the east side. After the commencement of the work, however, at the request of the property holders above the points mentioned, a borough meeting was held and a vote was taken to extend the line to Prospect street on the west side, and to Miss van Winkle's on the east. This extension added about 1,670 feet and the total length of all the branches is 1,693 feet, making 3,363 feet more than was estimated upon. No flush tanks were included in the original estimate, and if their cost (about $300) and the cost of the extra 3,363 feet be deducted, it will be seen that the work as at first planned was within the limit.

"From the irrigation field, a piece of land containing about four acres on the east bank of the river and directly back of the residence of Mrs. Sarah Coe, from whom it was purchased, an eight-inch iron pipe extends under the river, and 360 feet up the west bank, giving the end of the pipe an elevation of about fifty feet above the outlet on the irrigation field. At this point the sewer pipe is connected with the iron pipe, and runs in a northwesterly course, crossing South street at the northeast corner of the Fair Grounds, and then extending in the rear of the houses on the west side of South and North street to the north side of Prospect street at a point about 457 feet west of the west line of North street. The east line branches from the line above described about 260 feet east from where it crosses South street. This line

is laid in the rear of the houses on the east side of the street and crossing East street between the school house and the Webster place, and Torrington street between Miss Grant's and Mr. Cone's place. The line at this place makes an angle to the left and runs to a point in the rear of C. H. Coit's and from there to the head of the sewers, which is on the van Winkle property, 190 feet east of the side walk.

"A branch starts from the main sewer on East street and extends along the north side of the street to the front of the Phelps place and then by an angle to the right, through the lot of Mrs. Bidwell's south line, and a branch runs west to the east line of the Roberts corner. Short branches have only been laid from the main line to the Bronson property and also to both the Duffle places, and in other instances where the main line is back of the property lines, thus providing for all of North and South streets, a part of Prospect street, East street as far as the school house and C. W. Hinsdale's, and Torrington street as far as S. J. Cone's, making a total length of sewers, including branches, 14,500 feet, or very nearly three miles.

"All the work has been done in the most thorough and complete manner, the pipe very carefully laid to grade, the joints yarned and cemented and the earth carefully packed around the pipe to the depth of from eighteen inches to two feet before filling the ditch.

"Lamp holes (upright pieces of pipe reaching from the sewer to a height of four feet and eight inches above the surface) are placed at about every 150 feet. By means of these any trouble from stoppage or any other cause, can be located between any two of them. About one-third of these lamp-holes are covered with wire cloth firmly fastened to the socket of the pipe with wire, preventing anything likely to cause trouble from being dropped into the sewer, and at the same time allow the lamp-hole to serve as a ventilator. The balance are fitted with covers which can be removed when necessary. It was decided that flush tanks at the head of each line should be put in, as all authorities agree that they are of the greatest importance to a pipe sewer of this kind, but owing to a delay in the shipment of the siphons, the season was too far advanced to attempt to build the brick work necessary this fall. The siphons are on hand, the pipes are laid from the Water Company mains, and the cost of building the tanks has been estimated and included in the cost of the sys-

tem, and they should be put in operation as soon as possible when the weather is suitable in the spring.

"Only a portion of the necessary work has been done on the irrigation field as the season was so far advanced before this part of the work could be reached and owing to the difficulty of getting good men (the Italians not being of much use at this sort of work), it seemed best to leave this to be completed next spring. An open ditch has been dug through the west part of the field the entire length from north to south with three cross ditches. The upper end of the field has been leveled and partially prepared, and some work is being done to put the banks of earth in shape to take care of the sewage this winter.

"As soon as the weather permits in the spring the open ditches should be tiled and filled, a bank thrown up along the river front and then well seeded, and the entire available portion of the field leveled and properly prepared. When this is done the burgesses say it will undoubtedly take care of the sewage from the system for many years.

"The time selected to undertake this work proved very fortunate, as the almost uninterrupted pleasant weather and the consequent dry condition of the ground greatly facilitated the work and lessened the cost. The borough was also fortunate in the selection of Mr. T. H. McKenzie as their Engineer, and the success of the work is due in a great measure to his skill and attention to the details. The labors of Mr. Wm. T. Marsh, our efficient Warden, who has given most his sole time and attention to the work since its commencement without any remuneration whatever, cannot be too highly commended. Every tax-payer and citizen should feel a personal debt of gratitude to him for his valuable services."

Manchester Sewerage.

The State Board of Health held a special meeting at Manchester, to advise about a proposed mode of sewage disposal and inspect the site intended for irrigation. The following is the report to the parties asking the Board's advice:

New Haven, Conn., June 26th, 1891.

To whom it mdy concern:

The State Board of Health having been requested by interested citizens of South Manchester to visit that place and inspect the localities where it is proposed to utilize the land for purification of sewage, and to examine the plans devised by the civil engineers, respectfully report:

That on June 25th, the majority of the members of the Board in company with other experts, and with several of the citizens, did visit the said localities after inspecting the plans of the engineers and hearing their explanations of the same, and did subsequently in formal session unanimously adopt the following vote:

That having visited and inspected the field known as the "Hilliard Lot," with reference to its use as a place of disposal of sewage, this Board is of opinion that its location is unobjectionable and the character of its soil is well adapted to the final disposal of sewage by land purification. And in the judgment of this Board, the general conditions and qualities of the soil as described by the engineers are superior to those of the more distant field which was also visited.

All of which is respectfully submitted,

C. A. LINDSLEY, *Secretary*.

The following correspondence is published, as giving information on points frequently inquired about.

CONN., May 5, 1891.

C. A. Lindsley, M.D., Secretary State Board of Health, New Haven, Conn.

DEAR DOCTOR :—Will you please give your opinion as to what age of gestation a miscarriage or premature birth should be reported to the Registrar of vital statistics, as "a return of a birth," and "certificate of death."

It has been my practice in miscarriages at the third or fourth month to make no return. Such cases generally being the delivery of a dead and often partially decomposed fœtus.

Last night I attended a premature birth at the fifth month. The child lived an hour or more after its birth. It looks to me as though I should hand in to the Registrar a certificate of the birth and also one of the death in this case. Then the question arises, is a burial permit necessary for such a case?

The law is silent on this subject, and so I thought I would ask what you think about it. Your advice will be greatly appreciatod.

In case of a death in one town and burial in some other town I have been in the habit of giving two certificates of death; one for the town where the death occurred to get the removal permit on; the other to be recorded in the town where the body is buried to get the burial permit on.

Our town clerk thinks I am right and that was the opinion of the former Registrar of Norwich, Judge D. A. Y. He was a good lawyer, too.

The present town clerk of Norwich refuses to pay for a certificate of death where the death happened in another town, and says all that is necessary for him to give is a burial permit is the removal permit. He told me "you advised him to do so." And therefore he refused to pay me for certificates of deaths of persons who died in Salem and were

buried in Norwich. Section 106 of the Revised Statutes does not say anything about a Registrar giving a burial permit from a removal permit, but does say he "shall issue such permit whenever such certificate of death has been received by him."

I hardly see how you could give the Registrar of Norwich the advice he said you did, which appears to be in direct violation of the law.

But he is very positive about it, so I thought I would ask if you have so instructed him.

Yours truly,

——. ——————.

NEW HAVEN, CONN., May 8th, 1891.

Dr. —— ———:

DEAR SIR:—Replying to your enquiries of the 5th inst. The law says all births should be recorded. It does not appear to limit the record to any period of gestation. The New York practice is, as here, to record every certificate of birth that is returned.

It is also the law that a permit for burial shall be given stating place of burial of every deceased person.

In case of death in one town and burial in another, my opinion is that one certificate of death is enough. The law no where requires the physician to make two certificates. Nor does it require a town to pay for certificates of deaths occurring outside of its limits.

The Registrar of a town should issue a burial permit in my opinion, on presentation of a "removal permit." Why? because the removal permit is conclusive evidence that the death certificate required by law has been returned as the law requires, to the Registrar of the town in which the death took place. The "removal permit" also says the "certificate of death required by law, has been received and recorded."

There can be therefore, no good reason for another death certificate, because the removal permit contains what the law says it shall.

It cannot be denied, that the law is not as clear as it should be, but I believe the above is a proper interpretation of its language, and a correct expression of its real intention.

Very respectfully,

C. A. LINDSLEY, *Secretary.*

———, CONN., Oct. 7th, 1891.

Secretary State Board of Health, New Haven, Conn.:

DEAR SIR:—Several days ago I sent a letter to State Board of Health in reference to ———— ——— making a dumping ground of a brook that runs through our premises. They are placing cider pomace to the extent of several cart loads each day into this brook. My well has failed me from the dry weather and one other well above us. We are compelled to use this water for household purposes. The water is completely impregnated; tastes and smells of rotten apples and fermented cider. My live stock have to depend on this brook for drink.

Will you act in this matter under the State laws, in reference to pollution of streams. Something has got to be done.

Yours respectfully,

——— ———,

Clerk of Board of Health.

NEW HAVEN, CONN., Oct. 10, 1891.

Clerk of the Board of Health of ———:

DEAR SIR:—In regard to the complaint you make of the pollution of the brook, permit me to say, if you will examine attentively the statutes (which it is now your duty to do as Clerk of your Board of Health) you will find that your own Board is invested with all the power and authority necessary to abate nuisances which may exist anywhere in your town.

"The State law in reference to the pollution of streams," of which you speak, does not confer the slightest power upon the State Board of Health to prevent such pollution. The utmost the State Board can do under that law is to examine and report to the Governor on or before Dec. 1st; and there it ends. The Governor has no more authority than the State Board to help you. But your own Town Board can cause all sources of filth found within the town to be removed, which, in its judgment, shall endanger the health of the inhabitants. Gen. Statutes, Section 2592.

As I understand the statutes, this condition which you complain of comes exactly within the legal function and duty of your Town Board of Health to investigate and act upon. I do not think of anything which could more properly come before your Board for intelligent consideration than such a nuisance as you have described.

Your Town Board would find its work greatly simplified and lightened if it would enact some sanitary regulations such as are suggested in Circular No. 38, issued by the State Board.

If your town, for instance, had a sanitary law in force similar to Rule IV. in the Circular, your nuisance could be very promptly and easily abated, or might never have occurred.

Very respectfully,

C. A. LINDSLEY, *Secretary.*

REPORT OF DELEGATES

TO THE

EIGHTEENTH ANNUAL MEETING OF THE AMERICAN PUBLIC HEALTH ASSOCIATION.

Held at Charleston, S. C., December 16, 17, 18 and 19, 1890.

By N. E. Wordin, A.M., M.D., Bridgeport.

Charleston, S. C., was the gathering point for the eighteenth annual meeting of the sanitarians who comprise the American Public Health Association. The place is an attractive one, the time was well chosen and, despite the distance, the attendance was equal to that when held in larger cities. New England, the Middle and Western, as well as the Southern States, were well represented. The Provinces of Canada had their ablest men there and not the least important fact was that the Republic of Mexico completed the limit of the continent. Heretofore the clientelle of the Association had been bounded by the ocean on either side. No other State was more largely represented than Connecticut. Besides Doctors Wilson, Goodwin and Wordin, members of the State Board of Health and Prof. Lindsley, its Secretary, all regularly appointed delegates, there were Doctors Shepherd of Hartford, and DeForest of New Haven.

The Connecticut delegates entered Charleston in the early morning of Tuesday the 16th, in time for the first meeting at 10 o'clock, which was held in Hibernian Hall. The President, Dr. Henry B. Baker, Secretary of the State Board of Health of Michigan, occupied the chair during all the sessions. The local arrangements were in the hands of Dr. H. B. Horlbeck, Health Officer of Charleston, who spared no pains to make the occasion a success, both in profit and pleasure to all who attended. Sixty-two new active members were elected, of whom seven were from Connecticut.

All of the three papers read during the first morning's session related to Pulmonary Phthisis. The first one, by Dr. Domingo Ozvañanos, member of the Superior Board of Health of Mexico,

presented the claims of the Federal District in the Republic of Mexico as a suitable residence for persons predisposed to tuberculous affections and those already afflicted with pulmonary consumption. The high plateau, the even temperature, the aroma of the flowers which cover the fields, the rarity of the disease, so prevalent and so fatal in other places, were glowingly detailed. The average elevation of the table-land is 2,600 metres (1.63 miles), above sea level. Its location is between 19° 11′ and 19° 31′ of latitude north. The City of Mexico is nearly in the center of it. It is two kilometers (1.25 miles) distant from the eternal snow. The climate is temperate and almost equable, the difference between the hottest month, April, and the coldest, December, being 7.5°. The atmosphere is clear and the deaths from infectious diseases proportionally less than in other countries. Deaths from tuberculous diseases are 8.4 per cent. with regard to the general death rate. In England, Belgium, Italy, France and Spain, tuberculosis causes almost 20 per cent. of the general mortality; in the low lands of the United States, 18 per cent.; in the mountain regions 6.47 per cent.

The causes which produce in many places in the district an almost absolute immunity from tubercles in the lungs are cold, dryness and sunlight. These natural conditions prevent the origin and development of Koch's bacilli. The surface temperature of the soil in the valley of Mexico often goes down to zero. Microbes can only live and develop in a moist medium. The soil is dry because of rapid evaporation due to the rarefaction of the air and to its lack of relative humidity. Koch's experiments show that under the direct influence of the sunbeams, death of the bacillus takes place within a few hours at most. In this valley the luminous, calorific and chemical intensity of the sun's rays is extraordinary.

Besides these three, the exhalation of the odor of flowers which are remarkably abundant, may also contribute to both the scarceness of the disease and the healing of incipient tubercles.

The second paper, by Dr. Lawrence F. Flick of Philadelphia, forcibly illustrates what may be done in the prevention of disease by firm governmental interference. In 1782 the Kingdom of Naples adopted a legal enactment which provided,

1. That a physician should report every case of ulceration of the lungs under a penalty of three hundred ducats (about

$690.00) for the first offense and of banishment for ten years for the second.

2. That an inventory shall be made of the clothing in the patients' rooms by the authorities. If any opposition be made the penalty shall be three years in the galleys or in prison for the lower class, three years in the castle and three hundred ducats for the nobility.

3. Household goods not susceptible to infection were to be immediately cleansed ; those liable to carry infection, to be at once burned.

4. The authorities were to tear out and replaster the house, alter it from cellar to garret, carry away and burn doors and wooden windows and put in new ones.

5. The poor sick were to be removed to a hospital at once.

6. Newly built houses could not be inhabited before one year from completion and six months after plastering had been finished.

7. Superintendents of hospitals were compelled to keep in separate places clothing and bedding for the use of consumptives.

No mortality statistics for Italy as far back as 1782 can be found. The only idea of the amount of tuberculosis can be gained from contemporary writers. These, both Italian, English, German and French warrant the statement that in 1782 the mortality rate from tuberculosis for the Kingdom of Naples and for Italy was ten per one thousand living people. On the other hand, in 1887 the official returns show a mortality from consumption of 1.29 per one thousand for all Italy. Italy has at present the lowest mortality rate from consumption of any country in Europe, with the exception of Spain ; and that part of it which formerly constituted the Kingdom of Naples is, in the country districts and small towns, practically free from the disease. The reduction in the mortality from tuberculosis in Italy, since 1782, ranges from fifty to ninety per cent.

The lessons to be learned are a practical demonstration of the preventability of the disease, and some idea of what measures will bring about such a result.

In England, during the last forty years there has been a reduction of fifty per cent. in the mortality from tuberculosis as the result of isolation in special hospitals.

We have it in our power to wipe out this disease in a single generation. To do this would require well organized boards of

health, an enlightened public and the coöperation of the entire medical profession. Tuberculosis should be placed on the list of diseases returnable to the Board of Health, so that a record may be kept of the whereabouts of every case and of its movements from house to house. "From a careful topographical study of the disease in the fifth ward of the city of Philadelphia, extending over a period of twenty-five years, I am convinced that fully one-half of the cases of tuberculosis among the poor people have their origin directly or indirectly in infected houses. It is certainly humane to extend to the poor protection against a disease against which they have neither the knowledge nor the means to protect themselves. Preventive measures against tuberculosis imply nothing more, and I trust this convention will not adjourn without taking some steps looking to concerted effort in this direction."

Dr. B. F. Wyman of Aiken, S. C., closed the morning session with a short paper on the prevention of phthisis. It was of interest because of the large experience with the disease which one practicing in that place must have had. Dr. Wyman spoke, indeed, largely from personal observation. He maintained that consumption is as amenable to treatment and can be cured as readily as any constitutional disease, if it is diagnosed in its incipiency and the proper hygienic and medical treatment used with vigor. Physicians have failed to insist that the disease can be cured; they have resorted to much practice which must be called empirical. This has led the laity to believe the disease incurable and has driven many poor sufferers into the hands of the quack. Those who practice in Southern resorts rarely ever see a patient until there is a cavity in the lung and the general health wrecked. The family physician should not only advise but insist upon removal to some climate unsuitable to the development of the germ. Children predisposed should reside in such locality during the acquiring of their education. There is a great advantage in a permanent residence. Where only a few months of the winter are spent South, the rigors of two spring seasons are incurred—the most trying of all the months to invalids. After presenting the claims of Aiken upon those suffering from lung troubles, the Doctor presented an invitation to the Association, in behalf of the Mayor, the Board of Trade and the people of Aiken, to visit that famous resort at such time as might suit their convenience. This was accepted by a vote of

the Association and acted upon by gentlemen individually after the sessions of the convention had closed.

Resolutions were adopted that committees be appointed to formulate prophylactic measures for preventing the spread of tuberculosis, especially looking to the protection of the healthy members of the community from tuberculous infection; and to investigate and report to the next meeting such practicable methods of precaution against tuberculosis as are of universal application among the common people, including the destruction of the sputum of all tuberculous persons.

The evening session was held in the Grand Opera House. The exercises were complimentary to the Association. The clergy, the law and the medical profession were well represented in the speakers whose words of welcome were brilliant with wit and wisdom—fine examples of the native oratory of the South. The address of the President of the Association, Dr. Henry B. Baker of Lansing, Mich., was dignified and scholarly and elicited warm applause. Its subject was Sanitation in 1890; its theme, a general view of the present status of public health work in this country, a review of some of the progress made, and suggestions where effort seems to be most needed. Progress has been made in the knowledge of the causes of disease. Most important of these are Dr. Koch's investigations into the specific cause of consumption. The bacillus discovered by Loeffler is the cause of diphtheria. It passes into the milk of cows inoculated with it.

By the efficiency of the quarantine service, diseases formerly prominent scarcely attract notice. Comparatively little is now said of small-pox, cholera or yellow fever. In the year 1880, there were reported 22,854 deaths from typhoid fever in the United States, probably one-half the real number. Government should investigate the reason for the prevalence of a disease which leading sanitarians believe unnecessary. Much of the wonderful success in surgery is due to antiseptic and aseptic measures. Now if all purulent discharges and all pus which is accessible should be destroyed or disinfected, all inflammations, all the dangerous communicable diseases might be restricted and eventually stamped out, for all suppurative inflammations are breeding places for micro-organisms.

Inoculation is another means of escaping disease. There is great need that the general government should do for diseases of men in this respect what it has done only as yet for animals. If

our own national government would even do as much as to publish and thoroughly disseminate among our people the important results of the researches made by the German Imperial Board of Health, our people would have cause to rejoice and probably thousands of human lives would be saved through the knowledge thus obtained. Such work is of vastly more importance than the distribution of garden seeds, or any work done by Congress during the last twenty years.

The most rapid advancement of sanitary science is made, and is to be expected, where governmental aid is most complete and abundant. But certain organizations, such as State Boards of Health, have done much for the practical application of sanitary science. In the immediate practical results of their work some of these boards rival governmental boards of the most enlightened countries in the world. In Michigan, through measures maintained by the State Board of Health, the deaths from small-pox have been so reduced that more than one thousand five hundred persons have continued to live who would have died from that disease if its mortality rate had continued as it was before the establishment of the State Board of Health. That means six thousand cases of sickness from that loathsome disease, prevented. Similarly, there have been saved five thousand lives from scarlet fever, fifty thousand cases. Fifteen hundred cases of sickness from diphtheria are prevented annually. Other States ought to collect and publish evidence of the results of their work. For on many questions of public policy, no useful conclusion can be reached without a thorough knowledge of the facts involved. What disease is it most important for us to strive to prevent? The one which statistics show to have caused the most deaths.

Is a disease caused by climatic or meteorological conditions? Meteorological conditions must be known. There is a "Department of Labor" in the United States government. There should be a Department of Life and Health. To legislate in this direction is the wisest statesmanship. "Our people are destroyed for lack of knowledge." Under neglect of proper governmental protection of life and health a large proportion of the people prematurely die, and still larger proportions suffer sickness, life-long pain and physical and mental degradations, from causes which under proper governmental protection are easily preventable.

The exercises were opened promptly at 9 o'clock on Wednesday morning. Dr. G. C. Ashmun of Cleveland, Ohio, presented the report of the Committee on the Cause and Cure of Diphtheria. This Committee was appointed at Brooklyn, last year. They have directed their efforts chiefly to a report upon the clinical and sanitary fields of observation. The public seem apathetic and hopeless in regard to the prevention of diphtheria more than toward any other disease. There are not less than forty thousand cases yearly in the United States and Canada, with a mortality of ten thousand, with little demonstration of organized resistance. To remove this indifference by demonstrating specified causes or sources of the disease which can be resisted and overcome by any method compatible with the well-being of those affected, a list of inquiries was prepared and distributed. Opinions were sought from men known to have had experience and education in contact with the disease and who are also men of discrimination.

The very many interesting and valuable facts brought out by this report cannot be given here. A brief résumé shows that it is the generally accepted belief that diphtheria is dependent upon a specific germ; that as water and food are media by which the virus gains entrance, and the air passages, mouth and throat are the channels, that the disease is never caused by any agent developed within the body, but is always from without; that those affected should be carefully isolated from one to eight weeks after recovery; that sulphur, mercuric bichloride, heat, carbolic acid and pure air are the substances most reliable for disinfection; that public health demands the maintenance of hospitals for the isolation and treatment of those affected; that no climatic limitations affect either the development or the spread of it, and that domestic animals and fowls are believed to be liable to it.

In conclusion, and for the purpose of exerting some influence upon public opinion respecting the cause and prevention of diphtheria, the committee offered the following propositions:

First. We recognize the disease known as diphtheria to be due to a specific cause, owing to which all cases become dangerous as sources of contagion and infection.

Second. For the prevention of diphtheria, isolation of those affected and infected should be made scientifically complete in all cases; and we believe that by such isolation of all recognized cases the spread can be immediately checked.

Third. That while it may not be possible to secure prompt recognition and isolation of all cases of diphtheria in the present state of knowledge and opinion, we believe it the duty of local Boards of Health and health officials to provide stations, apparatus, and agents for the reliable disinfection of all bedding, clothing and articles which may be the holders and carriers of diphtheritic virus; such disinfection to be done at the public expense and under official control.

It was voted that the report be printed in pamphlet form as soon as practicable, and that copies be furnished each State Board of Health.

The first paper of the morning was by Samuel W. Abbott, M.D., Secretary of the State Board of Health of Massachusetts. In discussing the subject, What constitutes a filth disease? he made the principal point that a filth disease is one in relation to which filth in some form or other, either wet or dry, plays the part of an important factor only in its causation, but is not itself the direct cause; that the filth which promotes the spread of infectious diseases is specific filth, and hence the necessity of removing all filth is, that thereby we are sure to remove the specific filth, or that which contains the germs of infectious disease.

The afternoon session was given up to an outing for the practical examination of the system of car ventilation devised and patented by the Emerson Car Ventilating Company of Charleston. It was now nearly time for the Association to start, and Dr. Buist occupied a few moments explaining the method adopted for the satisfactory introduction of air into a railroad car filled with passengers without exciting a draught. About one thousand cubic feet of fresh air will be required per minute. Nearly two hundred patents have been taken out in this country alone to meet all the requirements necessary. None have been perfectly satisfactory. In the Emerson method, dirt, dust, smoke and cinders are excluded by keeping the cars closed entirely, all ventilators on the roof or in the sides of the car being removed. Introduction of air into such a sealed car is accomplished by means of friction cogs connected with the axles of the car wheels. These move a series of fans which collect the air, pass it through water in a box near the wheels, whence it is sent by a steady, uninterrupted flow into the car by means of tubes placed in the sides, the ceiling or floor of the car. A series of fans attached to the

same motive power and moving in an opposite direction constitutes the exhaust through orifices of exit placed in the upper part of the car. The amount of orifice at entrance and exit being equal, draughts are avoided. A short run into the country along the tract known as "The Neck," the garden of Charleston, was made over the Atlantic Coast Line. A fine opportunity was afforded of seeing the scenery of the Palmetto State, while a handsome lunch served at the end of the route left nothing to be desired.

The car ventilation was studied carefully and pronounced a success. Not even the combined energies of all the smokers present could make a disagreeable odor, while at the tubes of ingress there was no decided draught.

The evening session began at 8 o'clock.

A paper of interest to all, especially the dwellers in cities, was that on Treatment of Sewage by Chlorine, Precipitation and Sedimentation, by Professor Joseph H. Raymond, M.D. It was a description of the sewage-disposal works in successful operation at Coney Island, at Round Lake, New York, near Saratoga Springs, and at the New York State Soldiers' and Sailors' Home, Bath, Steuben County, N. Y. The system is sufficient, therefore, both for the sea-shore and for inland towns. At Coney Island two million gallons are frequently received at the sewage works in a single day, one-half of this often coming in four hours; at Round Lake, 90,000 to 150,000 gallons per diem. The sewage as it flows through the various tanks by automatic action, is treated by admixture of lime, by sedimentation and by perchloride of iron. To insure the destruction of typhoid germs, chlorine gas long recognized as an efficient disinfectant is added to the precipitate or sludge before its removal.

Chlorine added to sewage in the proportion of 0.015 per cent. will kill the typhoid bacillus in feces. The cost of this treatment will be about $1.10 per capita per annum, which would be reduced in large communities to ninety cents. The claims made for this method of sewage treatment are:

Concentration. The process for a large town can be carried on in a building fifty by one hundred feet or less.

Absolute control of all effluvium, which is thoroughly destroyed.

Economy in operation which is automatic. One man can superintend the works; two men being required one day per week to remove the sludge.

Convenience. The sludge rendered innocuous and inoffensive, can be removed in open carts.

Immunity from infection. The sewage can be disinfected so thoroughly as to kill all pathogenic organisms so that all danger of infection is removed.

After the reports of the various committees and while all were eagerly waiting for the excursion to the quarantine station as announced on the programme, Dr. Horlbeck, Health Officer of the Port read a paper on Maritime Sanitation at Ports of Arrival. The Association then took the revenue cutter Lot Morrill, and were taken a very interesting sail about the harbor of Charleston. They landed at James Island, where the quarantine station is situated. Here is probably the most complete disinfecting apparatus in the country. Practical working in the disinfection of ships and clothing was shown. The excursion occupied the remainder of the day. The morning of the fourth day was occupied principally with business and arranging for the visit to Aiken. Some members had already taken their departure. The following officers were elected :

President—Dr. Frederick Montezambert, Province of Quebec, Canada.

First Vice-President—Dr. Thomas F. Wood, Wilmington, North Carolina.

Second Vice-President—Dr. Henry B. Horlbeck, Charleston, South Carolina.

Treasurer—Dr. J. Berrien Lindsley, Nashville, Tenn.

Invitations for the meeting of 1891, excited warm discussion. Kansas City, Mo., was finally selected.

After the adoption of resolutions of thanks for courtesies and kind services the Association adjourned.

MISCELLANEOUS PAPERS.

THE ORIGIN OF CERTAIN CASES OF TYPHOID FEVER FROM MONEY ISLAND.

Report to the Connecticut State Board of Health.

By Herbert E. Smith, M.D.

Notice of a number of cases of typhoid fever among persons who had been spending a vacation at Money Island was received by the Secretary of the State Board of Health, from Danbury, early in September. Subsequently several cases were reported from other places, some from out of the State, in persons who had been temporary guests at Money Island, and in the last of September I was requested by the Secretary to investigate the origin of the outbreak.

Money Island is one of a group of islands situated in Long Island Sound off Stony Creek, and which are much resorted to during the summer months. The island has an area of from five to six acres and is a granitic formation. In portions the rock is bare, a part is low and marshy but it is chiefly covered with a shallow deposit of soil supporting a scanty vegetation. On it, are several cottages and one hotel. The population is a shifting one and during August consisted of from one hundred to one hundred and fifty persons.

The following is a statement of the cases of typhoid fever that have been discovered among those who were on the island during the summer. In each case except one, the diagnosis of typhoid fever was received directly by myself from the physician in charge of the case. In case No. 17 the physician was quoted by my informant as making this diagnosis.

Statement of Cases.

No. of Case.	When at the Island.	When Ill.
1	July 31 to Aug. 24	Aug. 18
2	Aug. 8 " 17	" 19
3	" 11 " 18	" 22
4	" 11 " 24	" 24
5	" 11 " 18	" 27
6	" 11 " 22	" 27

No. of Case.	When at the Island.	When Ill.
7	July 3 “ 17	Aug. 27
8	“ 3 “ 17	“ 27
9	“ 11 “ 18	“ 28
10	July 31 “ 23	“ 28
11	Aug. 11 “ 24	“ 29
12	July 31 “ 23	“ 29
13	“ 31 “ 14	“ 29
14	Aug. 10 “ 18	“ 29
15	“ 11 “ 22	Sept. 1
16	“ 10 “ 24	“ 1
17	“ 5 “ 21	“ 1
18	“ 11 “ 22	“ 2
19	July 31 “ 23	“ 4
20	“ 31 “ 23	“ 10
21	“ 31 “ 24	Oct. 3

The date when “taken ill” is that at which the patient went to bed. In typhoid fever, the invasion of the disease is so gradual that this event depends largely upon the type of the disease and on the individual. In many cases, the so-called walking cases, there is no confinement to bed at any period. The following summary is therefore striking as bearing on the question of the common origin of this group of cases.

Summary of Cases.

4	were taken ill from	Aug. 18 to 24
15	“ “ “	“ 27 to Sept. 4
2	“ “ “	Sept. 10 to Oct. 3

No. 20 (Sept. 10) was a member of a family in which there were three other cases, and No. 21 (Oct. 3) assisted in the care of the cases in the same family. From the later date at which these cases occurred, it is quite possible that they were the result of secondary infection.

The remaining cases were all taken ill at dates consistent with the belief that they received the contagion during the period of their stay on the island. The average date is Aug. 27. It is to be noted that these persons were all at the island together from Aug. 11 to 14.

The ages of the cases were as follows :

Under 10 years	4
From 10 to 25 years	6
“ 25 “ 35 “	2
“ 35 “ 50 “	1
“ over 50 “	7
Unknown	1

No. 1 was taken ill on the island on Aug. 18, but was removed to New Jersey on Aug. 24. The distribution of the cases was as follows: Danbury, 8; New Haven, 3; Hartford, 1; Meriden, 1; Brooklyn, 4; Orange, N. J., 3; Chester, N. J., 1.

The above are all the cases of typhoid fever developing among those who had been on the island during the summer, as far as known, with a single exception, to be mentioned later. With the exception of one, No. 14, they were all guests at the Shoshone Inn. Attention was therefore immediately given to the conditions existing at the inn, and the drainage, and the milk, ice and water supplies were carefully inquired into.

The Drainage.—The house contains no privies, these being situated some distance away, and so constructed that they project from a rock over the water in such a manner that all materials are washed away by the tide. The material collected in the chambers was thrown down the rocks back of the house into the water. There is but one drain pipe; this passes from the kitchen sinks under the kitchen floor past a cistern there situated, and discharges into the water under the privies. This drain receives only the kitchen waste and occasionally water from the laundry.

The Milk and Ice Supplies.—The ice all came from one source on the mainland, the milk came from several sources, but those who supplied the inn also supplied the majority of the cottages. Because these supplies were in common to the hotel and cottages they were not investigated further.

The Water Supply.—The island is supplied from cisterns of rain water and from three wells. One of the wells is used only by the residents of one cottage, and was not examined. Another, which may be called the old well, is situated on public land, and was in use during the season only by the hotel people. The third, the Gerald well, was used largely by the cottagers and also by the hotel people.

The *old well* has been in existence about twenty years. It is a dug well with stoned walls and no curb, but is covered with a platform, through an opening in which the water was drawn with a pail. It is about eight feet deep. Because of the rocky formations about it the probable drainage area is small and is liable to contamination from house and privy drainage. This well has long been considered unsafe and has been unused for drinking for several years except for some time this season by the hotel people.

The *Gerald well* is seven years old, is ten feet deep and has tile walls. It is covered and water is drawn by a chain pump. It is situated close to the foundation walls of a dwelling house, and in what would appear to be the drainage area, there are several houses and privies.

Samples were taken from both of these wells on September 21 and examined at the chemical laboratory of the Yale Medical School with the following results :

	Old Well.	Gerald Well.
Solids on evaporation	60.5	107.5
Volatile on Ignition	9.5	13.0
Chlorine	31.0	46.0
Nitrogen of Free Ammonia	0.094	0.008
Nitrogen of Albuminoid Ammonia	0.246	0.056
Nitrogen of Nitrites	none	0.002
Nitrogen of Nitrates	0.02	0.10
Color	yellow	none

Figures indicate milligrams per liter, and can be converted into grains per U. S. gallon, by multiplying by 0.0584.

The waters are obviously quite different, that from the Gerald well containing more mineral and much less organic matter than the old well. It appears to be a deeper and better filtered water. According to this analysis it is not notably contaminated, but gives too much albuminoid ammonia for a high grade water. Its surroundings also would lead us to class it as a suspicious water, which may be used for years as it has been in the past, but which is liable to become specifically contaminated. The old well is clearly highly contaminated and should not have been used for drinking. To prevent the danger arising from its possible use in the future it should be filled up.

None of the *cistern waters* were examined except the two which belong to the inn. One of these is supplied from the roofs of the main building, and is situated under the kitchen. It is large with brick walls, and is unventilated and uncovered except by the kitchen floor. No chemical analysis of this water was made, except to ascertain that it contained 3.2 milligrams of chlorine per liter. An inspection clearly showed that it was unsuitable for drinking, and it was stated that it had been used for no purpose except for filling the boiler and for washing.

The other cistern is supplied from the roof of the billiard hall and is situated under the southwest corner of that building. The

walls are of brick, the outer ones being the foundation walls of the building. The bottom is of granite rock covered with cement except in parts where it has cracked off. This rock is a large one sloping from the west of the building, under it toward the east and south, so that the deepest part of the cistern is in the southeast corner. When the cistern was full there had been a leakage at the junction of the rock and wall on the west and south sides. The cistern was covered only by the floor of the billiard room. The walls come up to this floor except on the east side where a considerable opening was left, designed for ventilation. Around the billiard hall there is a veranda, under which on the west side there was a coop in which chickens had been kept. On the veranda on the south side, there is a men's closet from which the urine was discharged on the rocks under the veranda. This closet has long been unused, but there still discharged there a wash sink situated in the corner of the billiard room. The slope of the rocks is to the southeast, and consequently away from the building, but it still appeared that there might be some soakage from this point into the cistern during low water. On the east, the space under the veranda was open, and it should be noted that it was toward this side that the ventilator opening above mentioned was directed.

The water had been exhausted from this cistern on August 18, but it was subsequently partly filled by rains. At the time of my visit on September 29 there was little water in it. Analysis of a sample then taken resulted as follows :

ANALYSIS OF BILLIARD HALL CISTERN WATER.

Solids on Evaporation	86.0
Volatile on Ignition	31.0
Chlorine	5.25
Nitrogen of Free Ammonia	0.006
Nitrogen of Albuminoid Ammonia	.350
Nitrogen of Nitrites	.002
Nitrogen of Nitrates	.060

This sample cannot be taken as representing the composition of the water at the time it was in use and nearly full, but the high chlorine, compared with that of the cistern under the main building, and the high figure for albuminoid ammonia, suggest the probability of contamination from the surrounding surface.

Inquiry concerning the sources of the water used at the inn during the season showed that the water from the old well was

14

used for drinking until August 6, when this use of it was discontinued, as the hotel people then heard that the water was commonly considered on the island to be unwholesome. It appeared, however, that it was still used for drinking in the kitchen. It was used for making tea and coffee a week after this date, and was also used in the pitchers in the chambers during the rest of the summer. Water from the billiard hall cistern was used in the chambers during the first of the season, and for drinking after August 6 until it was exhausted on the seventeenth or eighteenth of August. The table was then supplied for three days from the Gerald well, then for two days from the Sheldon well at Pine Orchard, then for two days from the well on Davis' Island, then for one day more from the Gerald well, and four days from the Brainerd House on the mainland. After this, the cistern under the billiard hall was used as it had rained.

From these facts concerning the sources of the water used, it appears that during the period, August 11 to 14, at which time all of those subsequently taken ill were at the inn together, the drinking water was obtained from the billiard hall cistern.

This connection, in the absence of all other positive indications of infection from other sources, fixed suspicion strongly on this water supply. The isolation of the building and the absence of privies or house drainage in the vicinity rendered the contamination of this water with typhoid contagium highly improbable from any source except from some attendant or visitor in the building itself.

It was at first believed, that it was probable that the infection had occurred from some chance visitor to this public room who was suffering from typhoid fever. In the absence at this part of the island of any privy, it is easy to see how a person, with such a diarrhœa as may exist in walking cases of this fever, might have been driven to the shelter afforded by the shed or space under the veranda to seek relief. This might especially have taken place in the evening. Granting such an occurrence, there are two ways in which infection of the cistern might have taken place. There might have been leakage into the cistern from the rock near the southwest end of the building, or on becoming dried the infectious material might have been blown by the wind into the cistern through the opening left for ventilation.

Information received later from one of the guests at the inn, however, showed that an attendant in the billiard hall was ill

during this period. This man could not be interviewed as he had left the State, but the facts concerning his connection in the matter were gathered from others. He had been employed as a painter about the premises in the spring but had left in June. At this time he was in ordinarily good health. He returned on August 8 and was given charge of the billiard hall, and remained on the island until September 3. On his return, he was much run down in health and was suffering from diarrhœa, fever and general prostration. He was unable to do heavy work but did attend to the light duties of the place, though his appearance was the subject of comment among the guests. He was occupied in and around the hall during the day and occupied a room over the hall at night.

As has been stated, there are no closet conveniences in or about the hall, and that the thing happened which has been above suggested is shown in a letter from him, forwarded to me by the proprietor of the house, in which he states in reference to his bowel troubles, "I did have to evacuate on the rocks and under the shed." It seems that at the time he considered himself to be suffering from malarial fever, but while on the island he was not prescribed for by any physician, and we have therefore no positive diagnosis. The symptoms which he is described as having had, however, are such as are seen in mild or walking cases of typhoid fever, and I submit as my explanation of the cause of the outbreak that this was a case of typhoid fever; that in one of the ways above suggested the cistern water became infected from his discharges, which, as has been shown, were favorably placed for such infection, and, that this water being at the inn for drinking, infected the guests.

Besides this attendant, the only case of typhoid fever from the island in a person not a guest at the inn was case No. 14, a girl residing with her parents at a cottage in the vicinity of the inn, and who ate all of her meals at home, but who "played most of the time with the children at the hotel and drank water there with them."

The exact number of guests at the hotel during the period of probable infection, August 8 to 15, could not be ascertained, but it was about 80, of whom all but 27 were transients staying for a single meal only, or but for one or two days. None of these transients are known to have been ill, while of the 27 guests remaining three days or over, 20 were ill. One case only was fatal.

It is also interesting to note that none of the inmates of the hotel other than guests had the fever. In explanation of this it may noted that the servants, like the transient guests, probably used but little of the cistern water as the old well water was in use for drinking in the kitchen, and this water although highly impure, as is shown by the analysis, did not contain the specific germ of typhoid fever.

To put the cistern into a better condition for the future, it was recommended that the opening for ventilation be closed and that a proper flue be carried above the roof for this purpose; that a tight cover be placed over the cistern under the floor; that the chicken coop be removed and that the spaces under the veranda be so inclosed that they would be inaccessible.*

This outbreak of fever with its attending suffering and death was not due to any special conditions pertaining to Money Island, but it was due to the lack of care and knowledge necessary for the protection of the water supply of such a place. Lack of adequate protection in this matter has been frequently observed at such places; and that the outbreak occurred here, rather than at some other point equally unprotected, is due to the chance that brought the initial case first into such relationship with this particular imperfectly protected water supply that infection could take place.

Some may wonder that this event had not occurred before in such a public place, some may wonder that the circumstances chanced to coincide at all, but the real wonder is that proprietors will continue, after so many warnings of this sort, to risk their pecuniary interests and the health and life of their guests.

Contamination of milk, ice or water may occur under even careful inspection, for our best judgments are not infallible, but the chances of contamination may be reduced to so small a minimum, that guests would do well to insist that the proprietors of such resorts should produce proof that care is exercised in such matters.

The water supply, where it must be stored on the premises or obtained from wells on a small island like Money Island, should be an object of special solicitude. By the expenditure of money, proper reservoirs may be constructed and reasonably protected. As additional safeguards we have the purification of water from

* I have been informed that these suggestions have been carried out and that the cistern has been re-cemented.

living disease germs by boiling and by filtration. Water from which the air has been expelled by boiling is generally unpalatable; on a large scale also this process, including cooling of the water, is somewhat difficult. Of filters there are many, most of them of limited capacity or of little value, but there are now obtainable unglazed porcelain filters of considerable capacity, even with low pressure, and which are effective in removing bacteria. It would seem reasonable to expect hotel keepers to provide for their guests such protection as these means furnish.

TUBERCULOSIS AS A LOCAL AND CONTAGIOUS DISEASE IN NEW HAVEN.*

By LOUIS S. DeFOREST, A.M., M.D.,

INSTRUCTOR IN CLINICAL MEDICINE, MEDICAL DEPARTMENT, YALE UNIVERSITY.

More than one-seventh of the human race die from tuberculosis. Dr. Salmon, estimating from census returns, placed the deaths from this cause in the United States for the year 1880 at 150,000.

Were such a number to die from any acute disease in one year, it would create a state of panic; but the stealthy, gradual progress of tuberculosis tends to prevent a true appreciation of the deadly rôle it ever plays in nearly every community. The attitude of the world on the subject has generally been one of resigned indifference.

The government of Italy at one time offered an exception to this rule. In 1782 tuberculosis had become so prevalent and virulent in the kingdom of Naples that a series of laws, intended for the restriction of the disease, were enacted.

The principal features were: 1. The compulsory notification by the attending physician of all cases coming under his care; 2. The destruction, after death, of the patient's personal apparel; and 3. The complete renovation of the dwelling. Ill-aimed and unscientific as were these laws, they wrought a great change. Dr. Lawrence F. Flick, who has studied this subject with great care, in considering the condition in Italy before the enactment of these regulations as compared with the present, writes: "It will not be overstepping the mark to place the mortality-rate from tuberculosis for the kingdom of Naples and Italy in 1782 at 10 per 1000 living. In 1887 the mortality-rate from all tubercular affections for all Italy was 1.29 per living 1000. Expressed in figures, the reduction in mortality from tuberculosis in Italy since 1782 ranges from 50 to 90 per cent."

* This paper by Dr. DeForest has been printed in a medical journal, but the original character of the investigation and its local interest, as relating to the most fatal disease in Connecticut, is thought a sufficient reason for presenting it in the annual report of the State Board, to which the author has kindly consented.

The great loss and trouble incident to carrying out these laws led to their gradual abandonment and final repeal in 1860.

Although, during the seventeenth and eighteenth centuries probably from 33 to 50 per cent. of the deaths in England were due to tuberculosis, English authorities were especially active in combating the theory of infection. The statistics of the Brompton Hospital for consumptives, by which it was shown that phthisis was exceedingly rare amongst the attending nurses and physicians, were very effectively used for this purpose. The favorite English theory was that of heredity.

The theory that consumption was contagious has never lacked advocates. But the indispensable, the connecting link was until very recent years lacking. When at last, in 1882 Koch announced and demonstrated that the bacillus tuberculosis was the ever-present, ever-active agent, it became possible to join theory and fact.

First, it was shown, by the investigations of Koch, Tappeiner, Bollinger, Grancher and Cadeac, Malet and Naegeli, that the mere breath of tubercular patients did not contain the bacillus and consequently was not infectious. Secondly, experiments of Koch showed beyond all doubt that inhalation of vapor charged with cultures of the bacillus (23 cultures extending over fifteen months) were highly infectious. Still further, Cornet proved that the dried sputum of phthisical patients contained bacilli in large numbers, and that inhalations or inoculations of animals with the bacilli or with the cultures obtained from this source were highly infectious. And lastly, Schill and Fisher were able to obtain results with sputum which had been in a dried state for ninety-five days. De Toma, also, found that sputum, which had been kept dry at an average temperature of 77°, was infectious after nine months. And Gebhard asserts that sputum, diluted to the proportion of 1 : 100,000, is still virulent.

We shall not need to relate the many experiments and researches made in this field, but may accept as fairly proven the fact that the dried sputum is in a very large majority of cases the conveyor of the infection. And, further, that this infection generally takes place through the lungs.

Naturally, the gain of the theory of infection has been the loss of the theory of heredity. The latter still has, however, many able advocates, and considerable statistical information has been collected bearing upon this point. Williams, in 1011 cases at the

Brompton Hospital, found that heredity (parents only) gave 24 per cent. Polluck's 1200 cases (including parents, brothers and sisters) furnished 30 per cent.; Colton's (same relatives) 36.7 per cent.; and Fuller's 85 cases (including grandparents) also gave 59 per cent. These statistics are more or less vitiated by the fact that undoubtedly a large majority of the patients were brought up in an atmosphere infected by their parents.

As an offset to the Brompton Hospital observations concerning nurses, Cornet has brought forward the following: The vital statistics of the religious orders in Germany for the care of the sick show that out of a total number of 2099 deaths there were 1320, or 62.80 per cent. from tuberculosis. While for the whole German nation the tubercular death-rate for the ages from 15 to 20 was only 18.64 for each 10,000 living, for the nurses it was 116.96.

Among the nurses the proportion of deaths from tuberculosis up to the age of fifty years was 73 per cent. To eliminate a very serious element of error, which greatly vitiates the Brompton statistics, only those orders were taken whose term of service was for life.

Stick has also brought forward the following fact, bearing strongly against heredity. He shows that in the Nuremberg Orphan Asylum there had been but one death from tuberculosis in eight years; and that in the Munich Asylum, among 361 children, more than one-half of whom had lost father or mother, or both, from tuberculosis, there had been in twelve years but one case of that disease.

It has been pointed out by several writers that the fact that nearly all cases of so-called hereditary consumption are cases of tuberculosis of the lungs, instead of such organs as the liver or spleen, is very strongly against the theory of heredity.

It might be well, as our statistics deal with tuberculosis in a city, briefly to mention and illustrate the principal hygienic conditions favoring the development of the disease under such circumstances. For large cities are in general unhealthy. Thus, Donaldson stated the rate to be in Amsterdam 171 deaths to 100 births; in Berlin 131 to 100; and in London 124.92 to 100.

Insufficient or impure air stands first among conditions favoring the development of phthisis. Prof. Wilson states that the quantity of oxygen is always sensibly diminished in large cities, even in the open street. Donaldson estimates the tubercular death-rate to

be at least 25 per cent. more than in the country districts. Dr. Richards writes that two out of three of the patients at his hospital for consumptives had led an indoor life. Of 3214 cases at the Brompton Hospital more than one-half had had indoor occupations. Baer states that, while the tubercular mortality in the whole world is about 15 per cent., in prisons it ranges from 40 to 50 per cent. In Germany, in a poorly-ventilated prison, the rate was 51.4 per 1000 living; while in a well-ventilated prison it was only 7.9 per 1000.

In 1858 the air in the Foot Guards' barracks was only in the proportion of 331 cubic feet per man, and the tubercular death-rate was 15.8 per thousand living. On the other hand, the Horse Guards, with 572 cubic feet per man, had a rate of 7.3 per 1000. Proper ventilation soon reduced the Foot Guards' mortality.

In 1856 Bowdin pointed out that, while the tubercular death-rate among the Guards was 12.5 per 1000 men, in the navy, from 1830 to 1856, it was only 1.76 per 1000. According to Wilson, the registration returns show that the deaths from tuberculosis, as compared with the deaths from all other causes, for the mercantile marine is ten times less than for the English land-population. If only the deaths between sixteen and forty-five are considered, the rate is sixteen times less. In the United States Navy for ten years the percentage of deaths from tuberculosis to deaths from all causes was 5.87.

Even a constrained and unvarying position has a deleterious effect. A series of statistics gives tailors out of each 100 deaths 39.9 of tubercular origin; and Dr. Guy found that those compositors who were compelled to retain a cramped position during work had 74 per cent. tubercular deaths, while among those whose work required the exercise of the whole body the rate was only 31 per cent.

Statistics have shown that those operatives living at some distance from their factory, that is those who were compelled to take even a certain, small amount of out-door exercise daily were less subject to consumption than those living close by.

Impure air comes to our notice generally in the form of air contaminated with dust, either metallic or vegetable. Many trades offer but a very short lease of life. So, for instance, the average duration of life for dry-grinders of forks is twenty-one years; for razor-grinders thirty-one years; for edge-tool grinders thirty-two. Among workers in copper and brass tuberculosis is

the predominant cause of death, lithographers losing nearly 50 per cent. M. de Neufville's statistics give locksmiths and blacksmiths 30.9 per cent., painters 32.9, and shoemakers 38.9 per cent.; and it has been stated that three-fifths of the flax-workers in Belfast were consumptive. Grinders' phthisis was formerly considered as non-tubercular in nature. Opinion is, however, no longer unanimous on this point, and such an authority as Fagge asserted its tubercular nature.

It will be noticed that all these trades result in what Koch has declared to be one of the necessary conditions for infection—that is, an abrasion of the mucous membranes. These artisans, with the many small wounds of the bronchial membrane, with a vitality lowered by insufficiently pure air day and night, are constantly in a state favorable to infection. Moreover, facts are accumulating to show that very many of the tenement houses are capable of furnishing this infection.

Another hygienic condition favorable to the development of phthisis is dampness. Dr. Bowditch was the first to call attention to this. His theory is strengthened by such facts as the following: After a system of draining had been introduced, Salisbury's tubercular death-rate fell 49 per cent., Ely's 47 per cent., Rugby's 43, and Banbury's 41 per cent. In 1881, in two contiguous health districts of Ontario, one of which is a plateau free from malaria, and the other a flat malarial district, the deaths from tuberculosis were in the former 8.5 per cent. of all deaths, and in the latter 12.7 per cent.

Cornet, in his investigations, repeatedly demonstrated the presence of the bacillus in dust taken from the rooms or the surroundings of tubercular patients. Flick, accepting this theory of infected dwellings, applied himself to the task of demonstrating it topographically. His map of the tubercular deaths for twenty-five years in the Fifth Ward of Philadelphia brings out the point very clearly.

When the writer began the study of this subject in New Haven, he had not had his attention called to Flick's pamphlet. Had such been the case, the plan of this work would probably have been somewhat altered.

In studying this question in New Haven we have no district equalling in antiquity and density of population Philadelphia's Fifth Ward. Nor are our vital statistics available for this purpose for so long a period as twenty-five years. Until this year, indeed, no separate topographical record of tubercular deaths was kept.

Unfortunately, owing to various errors in filling out and copying, the death returns cannot be used previous to 1876. For the fifteen years, 1876–91, however, they are fairly available. The renumbering of streets, the tearing down of buildings, and mistakes in the certificates have unavoidably introduced some errors; but the attempt was made, with the aid of maps and directories, to reduce these to a minimum.

In all there were copied out from the registers 3000 tubercular deaths. Of this number 381 were not available for our purpose. A part of these were cases occurring in public institutions, of whose former residence no record had been kept; some were deaths in public institutions of persons from the surrounding towns, and were intentionally omitted; and, finally, a part occurred outside the limits of our map (Westville and the annex.) In quite a number of cases, moreover, no address had been entered in the register.

The remaining 2609 deaths were divided among the various forms of tuberculosis, as follows:—

Phthisis pulmonum and hæmoptysis	2401
Tubercular meningitis	95
Tubercular peritonitis	4
Hydrocephalus	61
Scrofula	44
Hip-joint disease	4

These 2609 cases are represented, placed as accurately as the circumstances would allow, upon the main map. (See Map I.)

It will be seen that there are three principal districts of centralization. First, in the southeastern part of the city, in the neighborhood of East, Wallace, Hamilton, and Franklin streets, (Irish and Irish-American population); second, in the western part, in the neighborhood of lower Oak street and Congress avenue (Irish and Irish-American population); and third, in the northern part, in the region of Eaton and Webster streets (negro population). These two latter regions are somewhat loosely connected by a line of infection running along Day and Orchard streets.

The deaths on this main map were distributed as follows: Three hundred and ten houses had 2 cases each; 70 had 3; 28 had 4; 2 had 5; and finally, 3 had respectively each, 6, 7, and 9. The remaining houses had only one case each. That is, very nearly 16 per cent. had more than one case. This is not a very high per centage, but it will undoubtedly increase with years. It will be

seen that generally the houses are not isolated; that is, the infected houses adjoin or are in close proximity to each other.

The First Ward will be seen to be comparatively free. Nevertheless, it has a density of population per acre as a whole of 30; while the Ninth, containing Eaton and Webster streets, has only 6 per acre; and the Third, containing lower Oak and Congress avenue, has 23 per acre.

The second map (Map II.) is an enlarged reproduction of the southeastern district. While the various sources of error mentioned before have probably prevented absolute accuracy the deaths have been placed with considerable care. The 514 cases in this district (excluding the north side of State and the west side of Franklin) occurred in 361 houses. They were distributed as follows: Seventy houses had 2 cases each; 24 had 3; 12 had 4; 1 had 6; and 1 had 9. That is, about 27 per cent. had more than 1 case. There are about 650 houses in the district. Therefore, accepting the theory of infection, only about 54 per cent. of the houses would be capable of furnishing the germ of infection. If this supposition were true, we should expect to find the annual tubercular death-rate, in spite of new houses and the increased population, fairly constant.

For the fifteen years it was as follows:—

1876.	'77.	'78.	'79.	'80.	'81.	'82.	'83.	'84.	'85.	'86.	'87.	'88.	'89.	'90.
39	34	30	39	32	37	33	31	21	42	26	35	47	32	36

It will be seen that with only four exceptions the rate has been between 30 and 40.

The fact that this region now contains a large number of Italians will undoubtedly in a few years increase the number of cases of phthisis; for these people, coming from an out-door life in the Italian climate to an in-door life in our New England climate and living crowded together in small rooms, are especially liable to infection. As yet the local tubercular death-rate among them has been low. This is due to the fact that when their lungs become affected they almost invariably return to Italy. The disease is, however, undoubtedly on the increase among them. So far as the personal experience of the writer goes, both in private and dispensary practice, tuberculosis in the case of Italians tends to run an unusually rapid course; hæmoptysis seems to be an especially frequent and fatal complication.

In reviewing our statistics it was noticeable that the number of deaths from tubercular meningitis was unnaturally small. The fact that very young children would be especially liable to house

infection emphasized this. It naturally suggested the supposition that many such cases had been returned simply as "meningitis." Accordingly, all the cases returned as meningitis up to and inclusive of five years of age for the fifteen years, 1876–90, were copied out and investigated in respect to infected houses.

Of the 300 deaths 97 or 32¼ per cent. were found to have occurred in infected houses. Some cases were found where the death of the child was accredited to simple "meningitis," when the mother had died a few hours or days previously of "tuberculosis." In order to obtain some idea of the relation of this matter of infected houses to the ambulant cases of phthisis in the poorer classes, the 100 successive cases of phthisis previous to May 24, 1891, were taken from the books of the medical clinic of the City Dispensary and investigated in regard to this point. Of the 100 cases 52 were, at the time of entry, living in infected houses.

Unfortunately the death returns are not sufficiently complete to allow any deductions bearing on heredity.

On the point of nationality more may be elicited. Before, however, considering that subject, it may be well to point out one fact in Table No. 1 which would seem to favor the view of infection. It will be noticed that the first division under Class I., A (those born in this country of parents born in Ireland), have their highest death-rate, as is usual in tuberculosis, between the ages of twenty and thirty-five, and that after thirty-five the rate diminishes very rapidly. On the other hand, the second division, B (those born in Ireland), have a very low death-rate proportionally before thirty-five, and what is not usual in tuberculosis in this or their native country, a high rate after the age of thirty-five. This was formerly ascribed entirely to the change of climate; and this factor has undoubtedly some little weight; but were it the predominant cause it would be equally noticeable in all nationalities. It will be seen, however, that the Irish, of whom a greater proportion than of any other nationality persistently live in the infected district, differ in this respect from the Germans and English, who are much more scattered throughout the city.

In the rural districts, both in Ireland and here, the Irish consumptive death-rate is not high. In the tenement districts of manufacturing cities, both in Ireland and here, the rate is very high. Climate and heredity will not explain this. Insufficient, impure air and infected houses will.

TABLE I.—*Phthisis (tuberculosis) and hæmoptysis.*

	Under 1.		1.		2.		3.		4.		5.		5-10.		10-15.		15-20.		20-25		25-30.		30-35.		35-40.	
	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.
CLASS I.																										
A. Born in U. S. A. of parents in Ireland	15	7	4	2	2	1	0	0	1	1	0	3	2	4	3	14	37	38	60	57	50	50	35	31	17	15
B. Born in Ireland	—	—	—	—	—	—	—	—	—	—	—	—	0	1	2	1	4	10	19	19	30	45	39	36	34	52
CLASS II.																										
Born in U. S. A. of parents born in U. S. A.	9	9	3	1	7	0	0	1	0	0	0	0	1	0	2	7	11	22	34	22	30	39	26	31	20	21
CLASS III.																										
Born in U. S. A. of parents of unknown nationality	2	2	3	3	0	1	1	2	1	1	0	0	3	2	1	1	5	25	17	23	8	16	4	12	7	8
CLASS IV.																										
A. Born in U. S. A. of parents born in Germany	4	4	1	0	1	1	0	0	0	0	0	0	0	0	0	4	4	7	8	5	10	4	9	3	2	3
B. Born in Germany	—	—	—	—	—	—	—	—	1	0	1	0	0	0	1	2	0	1	1	4	7	4	8	2	7	6
CLASS V.																										
A. Born in U. S. A. of parents born in England	2	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	2	5	4	5	2	1	0	4
B. Born in England	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0	1	0	3	2	2	2	1	2	2	2	1
CLASS VI.																										
A. Born in U. S. A. of parents born in Scotland	—	—	0	1	0	0	0	0	0	0	0		0	1	0	0	0	0	0	3	1	1	3	0	1	0
B. Born in Scotland	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0	1	2	0	1	1	1	1
CLASS VII.																										
A. Born in U. S. A. of parents born in Italy	1	1	0	0	0	0	0	0	0	0		1	—	—	—	—	—	—	—	—	—	—	—	—	—	—
B. Born in Italy	—	—	—	—	0	1	0	1	0	0		0	0	0	0	0	1	1	2	1	2	0	0	1	0	1
CLASS VIII.																										
A. Born in U. S. A. of parents born in Sweden	—	—	1	0	0	0	0	0	0	0		0	0	0	0	0	0	0	0	0	1	0	—	—	—	—
B. Born in Sweden	—	—	—	—	—	—	—	—	—	—		—	—	—	—	—	—	—	0	1	3	2	1	1	0	0
CLASS IX.																										
Born in various countries; in the majority the father and mother being of different nationalities	4	0	0	0	1	0	1	0	0	0	0	1	0	0	2	2	7	8	5	8	11	12	4	3	10	5
CLASS X.																										
Negro	1	2	3	6	3	5	2	2	1	2	1	1	0	4	3	9	13	8	6	12	9	11	9	7	7	9
Unknown sex or age	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Sex totals at ages	38	26	15	13	14	9	4	6	4	4	3	6	6	12	14	42	82	124	156	163	170	196	143	131	108	126
Totals	64		28		23		10		8		9		18		56		206		319		360		274		234	

TABLE I.—*Phthisis (tuberculosis) and hæmoptysis*—Continued.

	40-50		45-50		50-55		55-60		60-65		65-70.		70-75.		75-80.		80-85.		85-90.		Un-known.		Sex totals.		
	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.			M.	F.	
CLASS I.																									
A. Born in U. S. A. of parents born in Ireland	2	6	4	3	0	0	1	1	0	1	1	0	0	1	—	—	—	—	—	—	1	—	235	235	470
B. Born in Ireland	37	42	31	33	35	19	30	11	19	13	18	9	8	11	2	4	1	1	—	—	—	—	309	307	616
CLASS II.																									
Born in U. S. A. of parents born in U. S. A.	24	16	22	16	18	11	8	6	5	12	14	8	7	13	1	5	4	8	0	1	—	—	246	259	495
CLASS III.																									
Born in U. S. A. of parents of unknown nationality	3	2	5	9	2	1	4	3	1	4	3	2	3	1	2	1	0	1	1	0	—	—	76	120	196
CLASS IV.																									
A. Born in U. S. A. of parents born in Germany	2	0	0	0	0	1	1	0	—	—	—	—	—	—	—	—	—	—	—	—	—	—	42	32	74
B. Born in Germany	7	4	4	4	7	3	6	2	4	2	3	1	—	—	—	—	—	—	—	—	—	—	57	85	92
CLASS V.																									
A. Born in U. S. A. of parents born in England	1	2	0	0	0	1	1	2	—	—	—	—	—	—	—	—	—	—	—	—	—	—	12	23	35
B. Born in England	6	1	4	4	1	0	2	1	2	2	1	1	0	2	0	0	1	0	—	—	—	—	25	21	46
CLASS VI.																									
A. Born in U. S. A. of parents born in Scotland	2	1	0	0	1	1	0	0	0	0	1	0	0	0	0	1	—	—	—	—	—	—	9	9	18
B. Born in Scotland	1	0	0	0	2	0	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	7	3	10
CLASS VII.																									
A. Born in U. S. A. of parents born in Italy	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1	2	3
B. Born in Italy	0	0	2	0	0	1	0	0	1	0	0	0	0	0	0	1	—	—	—	—	—	—	10	7	17
CLASS VIII.																									
A. Born in U. S. A. of parents born in Sweden	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	2	0	2
B. Born in Sweden	1	1	1	2	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	6	7	13
CLASS IX.																									
Born in various countries: in the majority the father and mother being of different nationalities	6	7	4	1	2	1	0	4	2	0	0	0	1	1	0	0	0	1	—	—	2	5	62	59	121
CLASS X.																									
Negro	3	7	2	7	7	9	2	3	2	1	0	3	2	2	0	2	0	1	—	—	—	—	76	113	189
Unknown sex or age	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	4	—	—	—	4
Sex totals at ages	95	89	79	79	75	48	55	33	36	35	41	24	21	31	5	14	6	12	1	1	7	5	2401		
Totals	184		158		123		88		71		65		52		19		18		2		12				

Single, 1033; Married, 1000; Widowed, 223; Unknown, 45; Total, 2401.

Table II.

Tubercular meningitis.

Under 1 year	25 deaths.
1 year	29 "
2 years	10 "
3 "	4 "
4 "	8 "
5 "	4 "
6 "	4 "
7 "	4 "
8 "	2 "
10 "	2 "
11 "	1 "
17 "	1 "
25 "	1 "
	95

Male	53
Female	42
White	91
Negro	4

Tabes mesenterica.

Under 1 year	9 deaths.
2 years	2 "
8 "	1 "
32 "	1 "
48 "	1 "
54 "	2 "
68 "	1 "
	20

Male	11
Female	9
White	19
Negro	1

Tubercular peritonitis.

Under 1 year	1 death.
8 years	1 "
14 "	1 "
30 "	1 "
	4

Male	1
Female	4
White	3
Negro	1

Hydrocephalus.

Under 1 year	41 deaths.
1 year	10 "
2 years	4 "
3 "	1 "
4 "	3 "
5 "	1 "
7 "	1 "
	61

Male	38
Female	23
White	60
Negro	1

Scrofula.

Under 1 year	13 deaths.
1 year	3 "
2 years	3 "
3 "	3 "
4 "	1 "
7 "	1 "
8 "	1 "
12 "	2 "
15 "	1 "
20 "	2 "
21 "	1 "
23 "	1 "
31 "	2 "
47 "	1 "
49 "	1 "
63 "	1 "
69 "	1 "
72 "	1 "
73 "	1 "
75 "	1 "
81 "	1 "
Unknown	2 "
	44

Male	20
Female	24
White	40
Negro	4

Hip-joint disease.

8 years	1 death.
10 "	1 "
20 "	1 "
41 "	1 "
	4

Male	3
Female	1
White	3
Negro	1

From Table I. it will be seen that the 2401 deaths from tuberculosis and hæmoptysis are divided among the different nationalities as follows:—

Irish parentage	470	or $19\frac{12}{24}$	per cent.
Irish	616	" $25\frac{15}{24}$	"
Native born of native parents	495	" $20\frac{18}{24}$	"
German parentage	74	" $3\frac{4}{24}$	"
German	92	" $3\frac{22}{24}$	"
English parentage	35	" $1\frac{10}{24}$	"
English	46	" $1\frac{21}{24}$	"
Negro	189	" $7\frac{20}{24}$	"
Other nationalities, combinations of nationalities, and unknown cases	84	" $15\frac{22}{24}$	"
		100	

As far as these figures go, it will be seen that, contrary to the general belief, it is not the Irish-Americans, who have the highest death-rate, but the Irish born.

Condensing the table brings out the nationality-rates more clearly :—

Irish and Irish parentage	$45\frac{3}{24}$	per cent.
Native of native parents	$20\frac{18}{24}$	"
German and German parentage	$7\frac{2}{24}$	"
English and English parentage	$3\frac{7}{24}$	"
Negro	$7\frac{20}{24}$	"

Unfortunately, the nationality statistics of the 1890 census are not yet available, and we have been obliged to estimate the present population by comparing the census of 1870 with that of 1880. In the census of 1880 the rule is drawn from a series of proportions: that for every 1000 born in Ireland and living in this country there are, approximately, 2414 persons in this country having Irish parents; for every 1000 German born, 2394 having German parents; and for every 1000 English born, 2082 having English parents.

Estimating by these proportions and by comparing the census of 1870 with that of 1880 we get the following results :—

	Population, 1880.	Population, 1890. (Estimated.)	Average number of tubercular deaths for the 15 years (1876–90.)	Number of deaths per living 1000 on average population.	
Total . . .	62,882	81,800*			
Irish . . .	9,630	9,674	41.0	4.2	5.5
Irish parentage .	23,112	23,218	31.4	1.3	
German . .	2,802	3,370	6.2	2.0	2.7
German parentage	6,715	8,068	5.0	0.7	
English . .	1,358	1,764	3.0	1.9	2.7
English parentage	2,827	3,672	2.4	0.8	
Native . . .	12,880	16,000	33.0	2.3	2.3
Negro . . .	2,192	2,895	12.6	4.9	4.9

The Irish and Irish parentage will be seen to outrank all others in its tubercular death-rate; more than the negro and more than double the native.

New Haven (Connecticut having as a State one of the highest tubercular death-rates) naturally has a high tubercular negro death-rate. Throughout the whole country, however, the negro rate is very little higher than the native white. The proportion

* To correspond with the range of the map, this population is estimated only for the city proper, i. e., exclusive of Westville and the annex.

of deaths among the negroes under twenty years is, however, noticeably large.

The death-rate for those of Irish parentage is very much lower than for the Irish-born. Thus, from our proportions, were the death-rate equal, for every 100 deaths of Irish-born we should expect about 240 deaths of Irish parentage. But, as far as our figures go, we only get about 125 deaths. The rate for the Irish parentage, in spite of the high Irish rate, is less than for the native class. It would be difficult to explain this by the theory of heredity.

Change of climate, especially from a somewhat warm to a somewhat cold one, undoubtedly is more or less favorable to the development of consumption. Thus, the native-born negroes in this country, as a whole, have only a little higher death-rate than the whites ; but negroes born in Africa and transported to foreign countries die in great numbers from tuberculosis. For instance at Gibraltar, for a period of nineteen to twenty years, the white tubercular death-rate per 1000 men was 6.1 ; the negro 33.5. At Ceylon the English white troops had a rate per 1000 men of 4.1 ; the negro troops of 10.5.

Flick, in his pamphlet "The Contagiousness of Phthisis," points out the various points of similarity between tuberculosis and other contagious diseases. The grouping, the preference for certain localities, the progress about these localities in search of favorable material, the movement from house to house, are in both practically the same. The writer regrets that he has not had sufficient time to prepare a map of the Pneumonia cases for the fifteen years in question, for he feels very sure that such a map would offer a telling contrast to the city map of tuberculosis.

Flick found in his ward-map for twenty-five years that 33 per cent. of the houses had had more than one case. In our smaller map for fifteen years the per cent. was found to be 27. This will undoubtedly increase.

How long a house remains capable of infecting its tenants we cannot tell from these statistics ; for these deal only with deaths. People may have become infected, and then have moved elsewhere, leaving, however, a supply of fresh infectious matter behind them.

The usual rate of progress may be illustrated by a few cases : Double house No. 1, side A, deaths, April '79, May '79, May '83, April '88, June '89, February '89; side B, August '83, May '85,

January '87. Double house No. 2, side A, July '76, August '80 May '89 ; side B, October '79, May '85, April '89.

Sometimes a death from tuberculosis will be followed by a succession of deaths from "meningitis."

We think that the accompanying maps and tables go far to show that consumption is endemic in certain parts of the city; that in these parts there are many houses in which it is distinctly dangerous to live. This danger is one which may be in a great measure overcome. It has been proved, beyond doubt, that the danger ceases when the air is not allowed to become contaminated with the dried sputum. This may be accomplished by the patients expectorating into vessels filled with water, care being taken afterwards to destroy the contents.

The poorer class of people may be much helped in their struggle with this foe by the passage of laws compelling a certain amount of ventilation in all dwelling-houses.

MAY 31, 1891.

NOTE.—These statistics must necessarily vary considerably from those of the local health department. In these latter, the returns for the whole city and town are included; also the deaths in public institutions and (until late years) the deaths from the condition known as "marasmus."

REPORT

ON THE

Examination of Certain

CONNECTICUT WATER SUPPLIES

BY

SAMUEL W. WILLISTON, M.D., HERBERT E. SMITH, M.D.
AND THOMAS G. LEE, M.D.

With a Description of Certain Water Bacteria

BY

CHAS. J. FOOTE, M.D.

REPORT ON THE EXAMINATION OF CERTAIN CONNECTICUT WATER SUPPLIES.

The work upon which this report is based, is a continuation of the investigations relating to the pollutions of streams, which were reported in the tenth and eleventh Annual Report of the Board; it was done in accordance with the appropriation made by the Legislature for this purpose. The appropriation became available on July 1, 1889, and the scope of the work and its details were arranged as speedily as possible, so that the first samples of water were taken for examination on Aug. 2. After this date, samples were taken regularly each month from the reservoirs under investigation until July, 1891, a period of twenty-three months.

The objects, sought to be accomplished in this investigation, were to ascertain the chemical and microscopical composition of the natural surface waters of the different sections of the State; and to collect such information concerning our chief supplies of drinking water, as would furnish data, which would be useful in devising plans for the improvement of existing supplies and in the selection of new sources of supply.

No systematic examinations of our waters have hitherto been made, and the lack of data concerning the composition of the normal waters of the State was found to be a difficulty in the previous work on the pollution of streams. Part of the data desired could, perhaps, have been better obtained from small streams not used as water supplies, but it appeared to those who planned the work that most of the facts required could be obtained from our reservoir waters, which are for the most part not subject to contamination from domestic sewage or manufacturing waste, and that the analyses of these waters would have the additional advantage of meeting our second object, and put valuable data into the hands of those having charge of these reservoirs.

It was not possible to examine all the public supplies of the State, therefore those selected for study were so chosen as to cover the widest possible range in the varieties of surface water supplies, and to include the water supply of as large a portion of the population as practicable. It was also necessary to pay attention to the facilities afforded for collecting samples at the different reservoirs and the possibilities of collecting without unreasonable expense.

The water supplies selected, and the periods during which samples were analyzed from each, are as follows:

Hartford, Tap Water,	23	Months,	beginning	Aug.,	1889
New Britain, Shuttle Meadow Lake,	23	"	"	"	"
Meriden, Storage Reservoir,	23	"	"	"	"
Middletown, Storage Reservoir,	23	"	"	"	"
New Haven, Lake Whitney,	23	"	"	"	"
" Wintergreen Lake,	12	"	"	"	"
" Lake Saltonstall,	11	"	"	"	1890
Rockville, Snipsic Lake,	11	"	"	"	"
Willimantic, Reservoir,	23	"	"	"	1889
Norwich, Fairview Reservoir.	23	"	"	"	"
Thomaston, Storage Reservoir,	23	"	"	"	"
Waterbury, East Mountain Reservoir,	23	"	"	"	"
Bridgeport, Mill River Reservoir,	11	"	"	"	1890
Danbury, Padanaram Reservoir,	12	"	"	"	1889
Stamford, Tap Water (Trinity Lake),	12	"	"	"	"

These sources represent the various types of reservoirs in this State. Lake Whitney and the Willimantic reservoir were formed by a dam across streams of such size that water commonly flows over the dam. Lakes Snipsic, Saltonstall and Trinity, are natural lakes of considerable size, which have in some cases been somewhat increased by a dam. The others are entirely artificial storage reservoirs, receiving water from small streams and by direct flowage from small drainage areas. Lake Wintergreen receives its water largely from a watershed covered with old woodland. The East Mountain, Waterbury, reservoir has a watershed with very little woodland. The Norwich reservoir is free from water plants and has paved banks. The Thomaston, Middletown and New Britain reservoirs contain considerable areas of shallow flowage and support large annual growths of water plants. The State possesses no considerable reservoirs of ground water, and there are no large filtering plants.

The population of the above mentioned cities, boroughs and villages (not the towns), was 327,525 according to the census of 1890, while that of the entire State was 745,881. The reservoirs examined constitute, therefore, the chief water supply of about 44 per centum of the population of Connecticut.

These investigations were made under the direction of a committee of the Board, consisting of Professors C. A. Lindsley and Wm. H. Brewer, by whom the work was assigned to those engaged to carry out the details. All of the analytical work was done in the laboratories of the Yale Medical School.

The general matters pertaining to the collection of samples, statistics concerning the reservoirs and the correspondence, were in the charge of Prof. S. W. Williston until his resignation and removal from the State in July, 1890, after which, Prof. Herbert E. Smith performed these duties. Prof. Smith has also prepared the report for publication. The charts were made by Mr. Chas. W. Merrels of the Senior class in the Sheffield Scientific School.

The chemical examinations were in charge of Prof. Smith, who had the assistance of Mr. Edward L. Bliss during both years and of Mr. Robert E. Peck during the second year. The data sought and the methods employed are described in another part of this report. They were for the most part those common to water analysis.

The microscopical examinations were made by Prof. Williston until July, 1890, and after this time, during the second year, by Dr. Thomas G. Lee. They consisted in a determination of the number of individuals of the different genera of organisms, not bacteria, occurring in the water. The methods employed in these investigations are also described elsewhere.

The bacteriological examinations were made by Dr. Lee, and consisted in a determination of the number of bacteria in the water, which were capable of development at the ordinary room temperature in a gelatine culture medium. The methods employed are elsewhere described. A detailed study of the forms and the methods of growth of a number of the water bacteria was undertaken by Dr. Chas. J. Foote, at the suggestion of Dr. Lee, and he has courteously furnished the Board with the paper descriptive of his observations, which forms a part of this report.

Each reservoir was visited by one or more of those engaged in the investigation, who selected the place for collecting the samples. These were regularly taken at the time and place designated, by the gentlemen mentioned under the description of each reservoir. To all of these gentlemen we are much indebted for many courtesies and prompt attention to our requests.

Bottles were sent from the laboratory at stated intervals to each collector, by express, together with a notice by mail of the time samples were expected to arrive at the laboratory. Two sets of samples were taken at the same time and place, one for the chemical and microscopical examinations, and one for the bacteriological. The methods of taking these samples may be found elsewhere described by Prof. Smith and Dr. Lee.

In addition to the examination of reservoir waters, a series of chemical examinations were made of the Connecticut river water to ascertain the degree of its pollution. A report of these examinations will be found after those pertaining to the reservoirs. Observations were also made concerning the conditions of rainfall and temperature in the State during the time of the investigations.

Rainfall for the Two Years ending June 30, 1891.

The table given below shows the average rainfall as observed at several stations in the State, during the two years in which analyses were made. The data given in this table were taken in part from the Bulletin of the New England Meteorological Society, and in part were obtained by correspondence with the observers. For information not contained in the Bulletin our thanks are especially due to Mrs. B. F. Harrison and Mr. W. J. Morse of Wallingford, Mr. J. A. Brand of Norwich, Mr. N. J. Welton of Waterbury, Mr. H. D. A. Ward and Major J. C. Broatch of Middletown, Mr. Ezra Clark of Hartford, Mr. H. T. Stenson of Farmington and Dr. B. N. Comings of New Britain.

The data concerning the rainfall, given in the tables and charts of the chemical and bacteriological results, were derived from the same sources. The expression "rainfall for previous month" means the rainfall for the month ending on the day set for the collection of the samples at each place, i. e. from 1st–1st, from 10th–10th and from 20th–20th in the cases of the different reservoirs.

Data for these calculations had to be obtained from local observers, and are therefore given only in those cases where observations are regularly made at points near enough to the reservoirs to be of interest.

The average annual rainfall at New Haven, for the years 1804–90, inclusive, was 45.7 inches, and for the last twenty years of this period, it was 50.3 inches. Corresponding figures for the entire State would most certainly be less. The rainfall for the State, as it appears in the table, was 59.28 inches for the first year, and 52.59 inches for the second. During this period it was, therefore, considerably above the usual precipitation. This large precipitation must have had some influence on the results of analyses, rendering them somewhat different from

MONTHLY AND ANNUAL PRECIPITATION, IN INCHES, FOR THE TWO YEARS ENDING WITH JUNE, 1891.

			1889-90.													1890-91.												
Location.	Elevation	Observers.	July.	Aug.	Sep.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	Total	July	Aug.	Sep.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	Total
ansfield	640	E. A. Bailey	11.39	3.78	4.00	5.52	5.91	2.88	2.66	3.28	6.12	3.15	6.33	2.79	57.81	2.81	4.26	7.19	5.25	0.82	4.21	8.52	5.64	4.42	3.51	2.50	1.84	50.97
armington	...	H. T. Stenson	10.33	4.32	5.50	5.02	8.40	2.85	2.40	3.69	6.05	2.38	5.09	2.82	58.85	4.36	3.75	4.43	7.06	0.62	4.36	10.32	4.96	5.95	3.25	1.92	1.46	52.44
anton	650	G. J. Case	9.07	3.71	6.80	4.29	7.62	2.89	2.47	4.39	5.80	2.35	5.01	3.42	57.82	4.66	5.36	5.54	7.88	0.70	4.20	9.29	4.46	5.10	3.91	2.03	3.11	56.24
ew London	47	U. S. Signal Service	6.91	4.15	4.93	5.25	6.19	1.90	3.31	2.40	8.60	4.86	4.51	2.94	55.95	3.07	2.43	5.51	6.43	0.86	3.93	6.36	6.46	3.99	3.12	1.42	2.81	46.39
oluntown	260	Rev. E. Dewhurst	9.35	5.38	7.07	4.30	7.13	3.05	3.14	2.55	7.41	5.38	3.65	3.26	61.67	2.79	4.67	4.91	8.47	1.10	5.03	8.20	6.52	4.85	5.31	2.03	1.97	55.85
iddletown	70	H. D. A. Ward	13.43	5.12	4.72	5.47	7.03	2.79	2.84	3.28	7.45	2.84	5.51	2.16	62.64	4.16	4.66	5.97	7.52	0.75	4.46	9.24	6.09	5.96	3.90	1.62	2.70	57.03
aterbury	450	N. J. Welton	10.83	2.76	4.26	4.03	8.74	2.74	2.54	3.77	6.08	2.43	5.97	3.26	57.41	4.96	4.50	4.98	6.89	0.93	5.21	10.06	5.65	5.08	3.86	1.84	1.14	55.10
ew Haven	107	U. S. Signal Service	17.08	4.38	4.98	3.96	7.78	2.62	3.07	3.19	6.60	2.89	4.24	3.12	63.81	6.59	2.67	5.38	7.63	0.67	2.90	6.77	5.88	3.68	2.35	1.92	1.90	48.34
est Hartford	...	Water Commissions	9.33	4.70	3.72	5.10	8.29	2.41	2.25	3.48	6.18	2.92	5.08	3.37	56.83	3.83	4.12	4.55	5.86	0.80	3.18	8.48	4.27	4.75	3.35	2.00	1.92	47.11
orwich	...	Water Commissions	9.05	3.78	4.54	5.80	7.16	2.12	2.86	2.54	7.12	4.18	3.75	2.13	55.03	2.53	3.67	5.20	7.02	0.83	4.62	7.99	3.78	4.90	4.54	1.57	7.31	53.96
allingford	133	Mrs. B. F Harrison	13.58	5.42	5.02	4.38	8.11	2.65	3.31	5.09	6.43	2.67	4.22	3.34	64.22	4.85	3.84	5.69	7.21	0.97	4.18	9.15	6.73	5.05	3.87	2.34	1.29	55.17
o. Average	...		10.94	4.32	5.05	4.83	7.49	2.63	2.80	3.42	6.71	3.28	4.85	2.96	59.28	4.06	3.99	5.40	7.02	0.82	4.21	8.58	5.49	4.88	3.72	1.93	2.49	52.59

what would have been obtained during drier seasons. That the effect of a large fall of rain is especially marked when the ground is frozen, is shown by the very general and marked decrease in the total solids following the large precipitation of January, 1891.

During the fourteen months, September, 1889, to October, 1890, inclusive, the rain was collected in an eight inch gauge on the roof of the Yale Medical School building.

The precipitation for this period at this gauge, 64.66 inches, was in close accord with that observed at the U. S. Signal Station several blocks distant, 64.72 inches, although there were considerable variations in the records of individual months.

The water collected in this gauge was filtered, if turbid, and stored during the month in tightly stoppered glass bottles. At the end of each month, it was well mixed and analyzed with the results shown in the adjoining table.

RESULTS OF CHEMICAL EXAMINATION OF RAIN WATER.

Figures in heavy face type indicate milligrams per liter, or parts per million.

Month.	Am't collected on 8-in. gauge, in liters.	Rain fall, in inches.	Residue on Evaporation.		Nitrogen.				Chlorine.	Total Chlorine per acre, in grams.
			Total at 100° C.	Loss on Ignition.	Of Free Ammonia.	Of Albuminoid Ammonia.	Of Nitrites.	Of Nitrates.		
1889										
September	4.102	4.98	**37.2**	**5.0**	**0.52**	**0.142**	**0.007**	**0.04**	**3.73**	1909.1
October	3.600	4.37	**27.8**	**3.4**	**1.20**	**.058**	**.010**	**.03**	**1.10**	499.1
November	6.555	7.96	**18.0**	**2.2**	**.50**	**.058**	**.004**	**.04**	**2.00**	1634.6
December	1.790	2.17	**45.2**	**7.4**	**1.35**	**.083**	**.000**	**.07**	**4.60**	1023.2
1890										
January	2.190	2.66	**47.4**	**9.2**	**5.20**	**.122**	**.007**	**.06**	**4.00**	1098.0
February	2.285	2.77	**31.8**	**4.2**	**1.10**	**.088**	**.008**	**.12**	**4.40**	1247.8
March	5.675	6.79	**38.8**	**3.0**	**.45**	**.078**	**.001**	**.12**	**.90**	636.4
April	2.050	2.49	**28.0**	**6.2**	**1.60**	**.098**	**.010**	**.16**	**2.50**	636.4
May	3.640	4.42	**27.0**	**5.0**	**.83**	**.086**	**.002**	**.04**	**1.40**	623.9
June	2.650	3.22	**37.4**	**4.6**	**.65**	**.080**	**.005**	**.08**	**1.00**	324.4
July	5.810	7.05	**24.0**	**3.6**	**.34**	**.052**	**.002**	**.04**	**.70**	499.1
August	2.380	2.49	**42.2**	**6.4**	**.36**	**.052**	**.002**	**.02**	**1.65**	486.6
September	4.470	5.43	**25.6**	**4.2**	**.40**	**.050**	**.006**	**.03**	**.73**	399.3
October	6.475	7.86	**27.0**	**5.4**	**.54**	**.054**	**.005**	**.07**	**1.08**	861.0
Average	3.833	4.62	**30.4**	**4.5**	**0.83**	**0.071**	**0.0046**	**0.06**	**1.77**	848.5

Without doubt, the solids and nitrogenous constituents as here given are greatly above the amounts which would be found in rain water collected in country districts, away from the smoke-contaminated city atmosphere. The total chlorine precipitated during the fourteen months was at the rate, per acre, of 11878.9

grams or 26,18 pounds, equivalent to 43.14 pounds of common salt.

During the second year, a twenty-four inch gauge was employed, by means of which a quantity of water, sufficient for analysis, could be collected even during small rainfalls. The precipitation during a number of storms was thus separately collected and examined. The object, with which these analyses were made, was to ascertain the relation between the amount of chlorine and the direction and velocity of the wind, but the number of analyses is too small to admit of trustworthy deductions. The results for chlorine and ammonia only are given.

ANALYSES OF THE RAINWATER OF INDIVIDUAL STORMS.

Date of Fall.	Amount in Inches. U. S. Signal Service Records.	Nitrogen of Free Ammonia. Parts per million.	Chlorine. Parts per million.
May 14–15, 1890	0.68	0.40	1.50
" 20, "	.39	.21	1.90
" 26–27, "	1.02	.44	1.60
Aug. 18–20, "	.75	.38	.70
Nov. 11–12, "	.26	1.25	2.35
Dec. 17, 8 A. M.–5 P. M., 1st Part of storm	.54	.50	1.50
" 17, after 5 P. M., 2d Part of storm	.82	.30	.22
Jan. 11–12, 1891	1.15	.66	2.52
" 29, "	.50	2.18	.62
Feb. 3, "	.76	.72	1.15
" 6–10, "	1.52	.66	.78
" 20–22, "	1.18	.57	.70
" 25–27, "	1.05	.80	.70
Mar. 8–10, "	1.54	.88	1.40
" 12–13, "	.88	.48	.66
" 21–23, "	.76	1.42	5.17
Apr. 11–12, "	.96	1.42	2.30
May 16–17, "	.80	1.66	3.30
June 2–3, "	.59	.59	.60

TEMPERATURE VARIATIONS DURING THE TWO YEARS ENDING IN JUNE, 1891.

The following table will serve to show the average air temperature of the State during the two years. The data are from the same sources as those pertaining to rainfall.

Records of the ground temperature at New Haven were obtained by a long thermometer, so set, in a proper case, that the bulb was four feet under the surface. Observations were made from October, 1889, to June, 1890, by Prof. Williston, with the

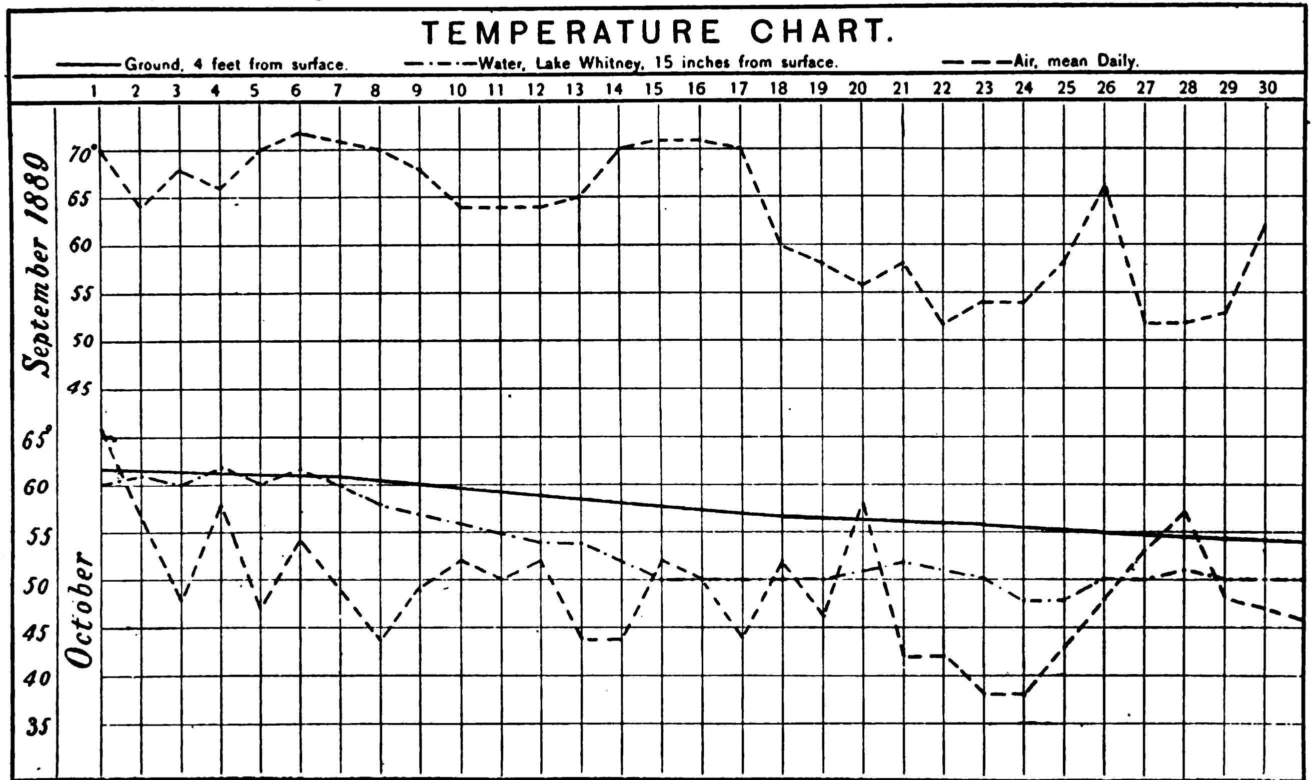
MEAN MONTHLY AND ANNUAL TEMPERATURE.

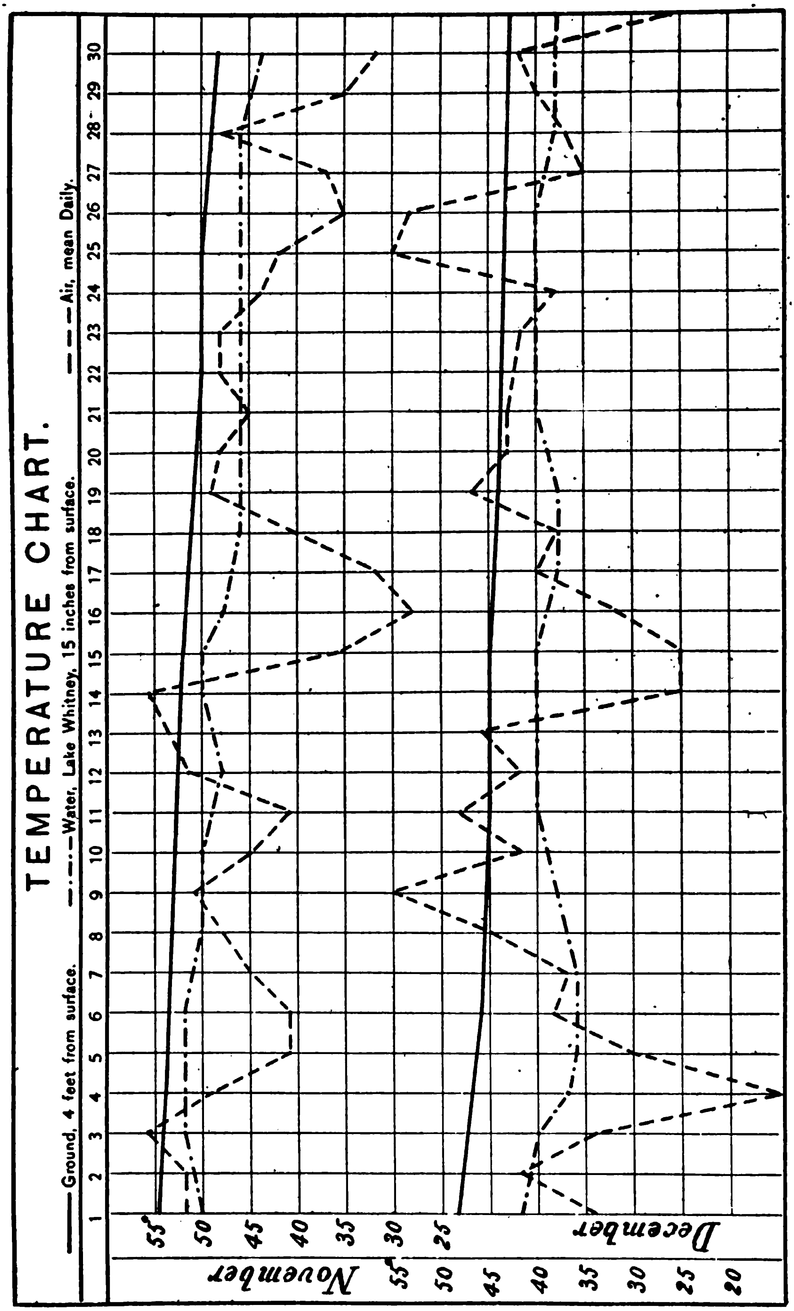
Location.	1889–90. July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	Aver'ge	1890–91. July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	Aver'ge
Colchester	68.9	67.6	62.6	48.2	42.6	37.2	34.0	33.0	32.3	46.4	56.6	65.1	49.5	68.8	68.5	62.3	49.4	40.1	26.7	30.7	31.0	38.8	48.5	55.5	65.8	48.9
Middletown	70.0	68.0	62.9	48.4	43.2	36.6	34.6	34.9	33.3	47.4	58.1	66.5	50.3	70.2	69.3	62.4	50.0	40.8	25.4	29.2	32.0	35.0	49.3	57.1	66.9	49.0
New Haven	70.0	68.5	63.0	48.4	44.2	38.8	35.4	35.5	34.2	47.0	56.8	65.9	50.6	69.4	69.1	62.8	51.3	41.7	26.6	30.8	32.3	35.1	48.6	56.0	66.2	49.2
Waterbury	69.7	67.0	62.0	47.9	41.7	35.5	31.8	33.7	31.6	45.7	57.2	66.4	49.2	70.0	69.1	61.8	59.6	37.4	22.4	37.2	31.0	34.8	....	56.5	67.3	49.7
New London	69.9	69.0	63.8	50.2	45.8	40.0	36.7	36.8	36.1	47.2	56.3	65.3	51.4	69.7	69.6	64.2	52.1	43.2	29.4	31.8	32.4	35.6	47.6	54.7	64.4	49.6
Mansfield	68.0	65.3	60.4	46.4	40.9	35.1	31.9	31.6	31.0	44.4	55.4	63.4	47.8	67.5	66.5	60.6	47.9	38.2	23.4	28.6	29.1	32.3	46.5	54.4	64.2	46.6
Average	69.4	67.6	62.5	48.3	43.1	37.2	34.1	34.3	33.1	46.4	56.7	65.4	49.8	69.3	68.7	62.4	51.7	40.2	25.6	31.4	31.3	35.3	48.1	55.7	65.8	48.8

thermometer situated in a protected spot at 297 Crown st., and from June, 1890, to July, 1891, by Prof. C. A. Lindsley, with the thermometer situated in the garden, in the rear of No. 15 Elm st. Observations were not made daily, but from time to time, several being made each month.

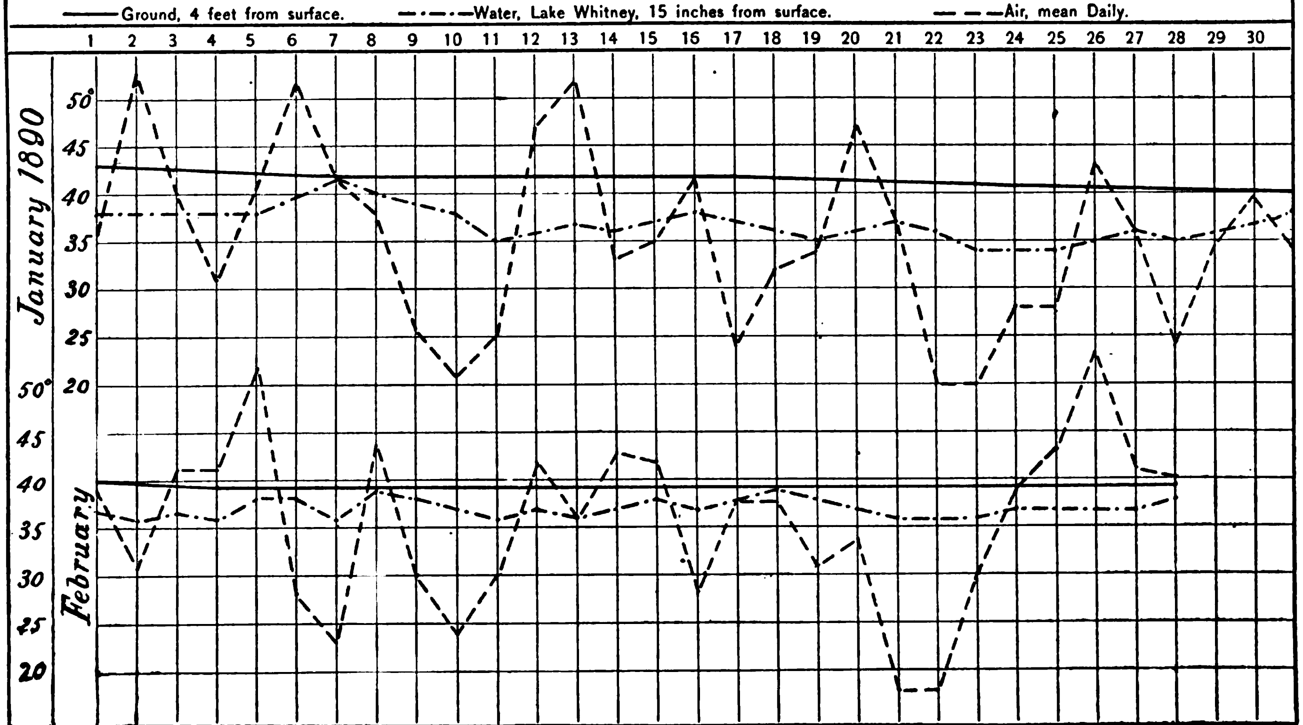
By the courtesy of Mr. E. I. Foote, Secretary of the New Haven Water Co., daily observations of the temperature of the water of Lake Whitney were taken by Mr. Villazon, engineer at the pumping works. These observations were made just above the dam, by immersing the thermometer bulb 15 inches below the surface.

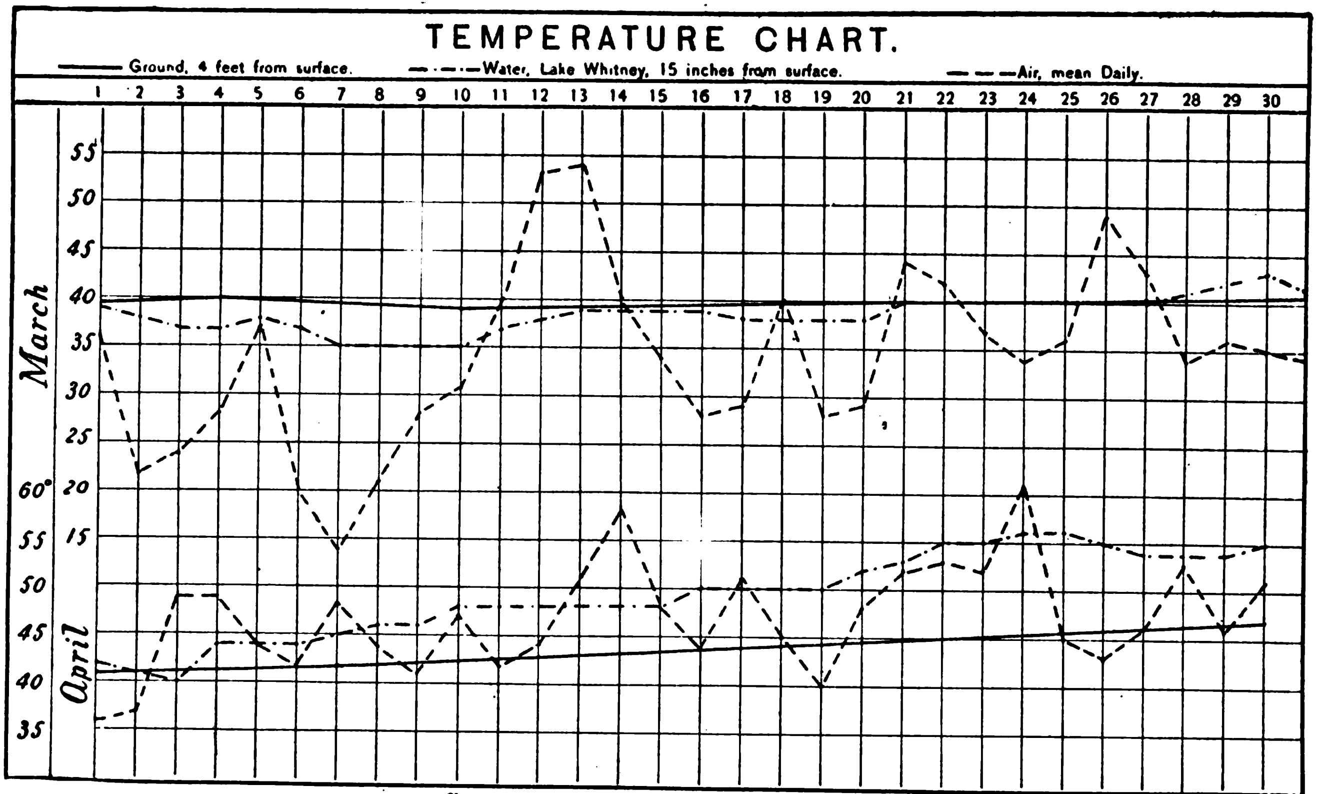
The following charts give the results of these observations, together with the mean daily air temperature, according to the records of the U. S. Signal Service Station at New Haven.


TEMPERATURE CHART.
Ground, 4 feet from surface.
Water, Lake Whitney, 15 inches from surface.
Air, mean Daily.
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30
September 1889
70° 65 60 55 50 45
October
65° 60 55 50 45 40 35

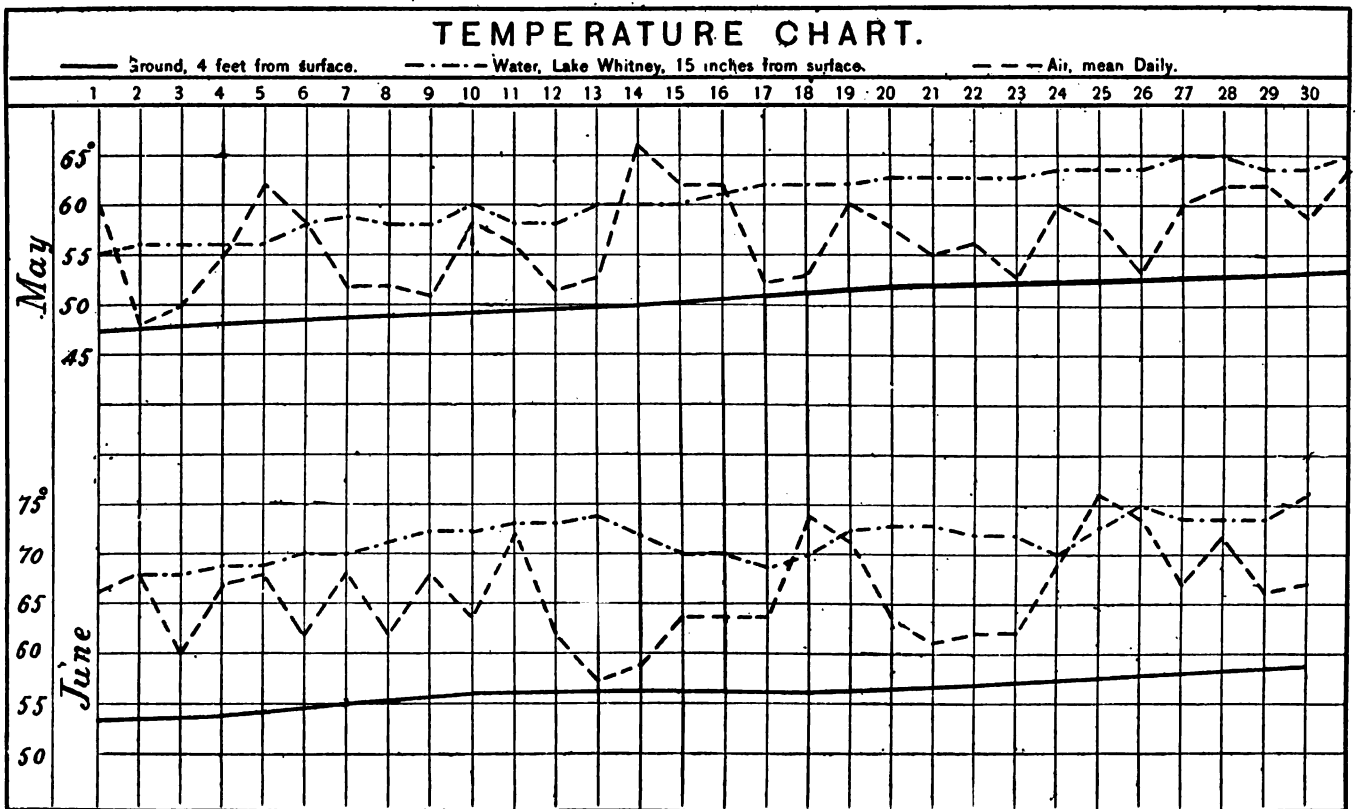

TEMPERATURE CHART.
Ground, 4 feet from surface.
Water, Lake Whitney, 15 inches from surface.
Air, mean Daily.
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30
55 50 45 40 35 30 25
November
December
55 50 45 40 35 30 25 20

TEMPERATURE CHART.

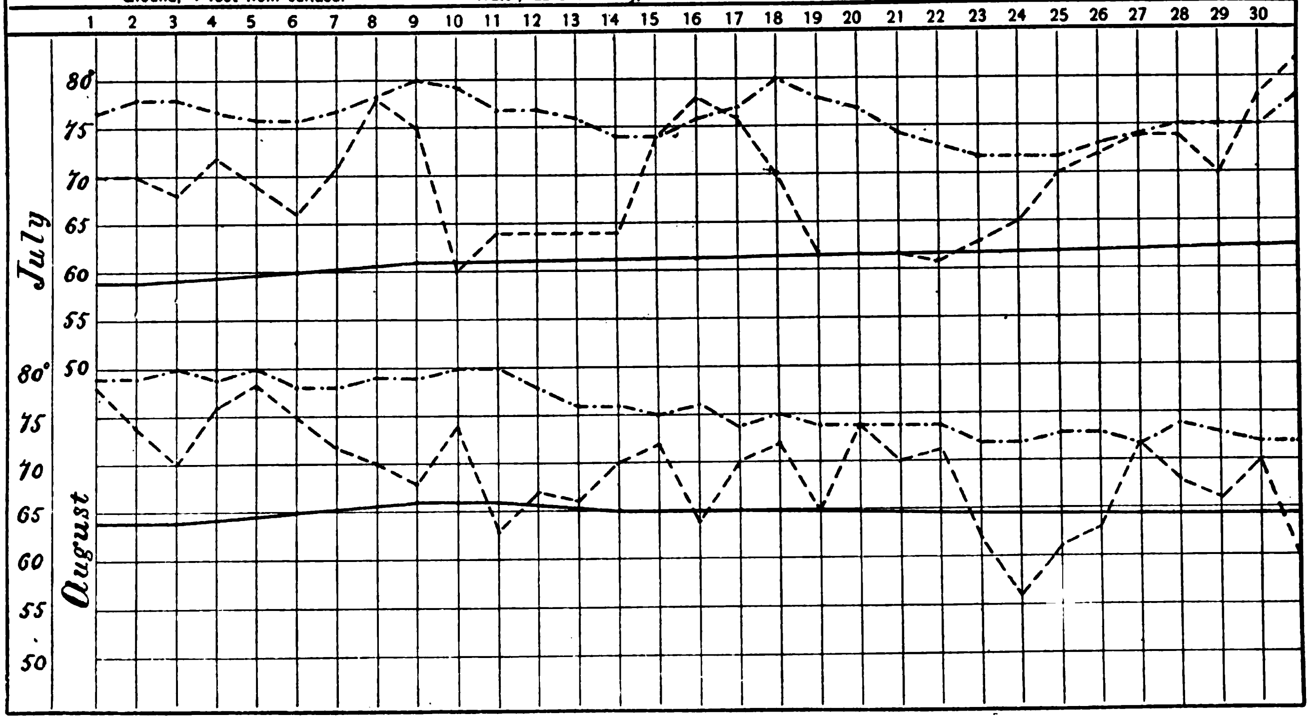




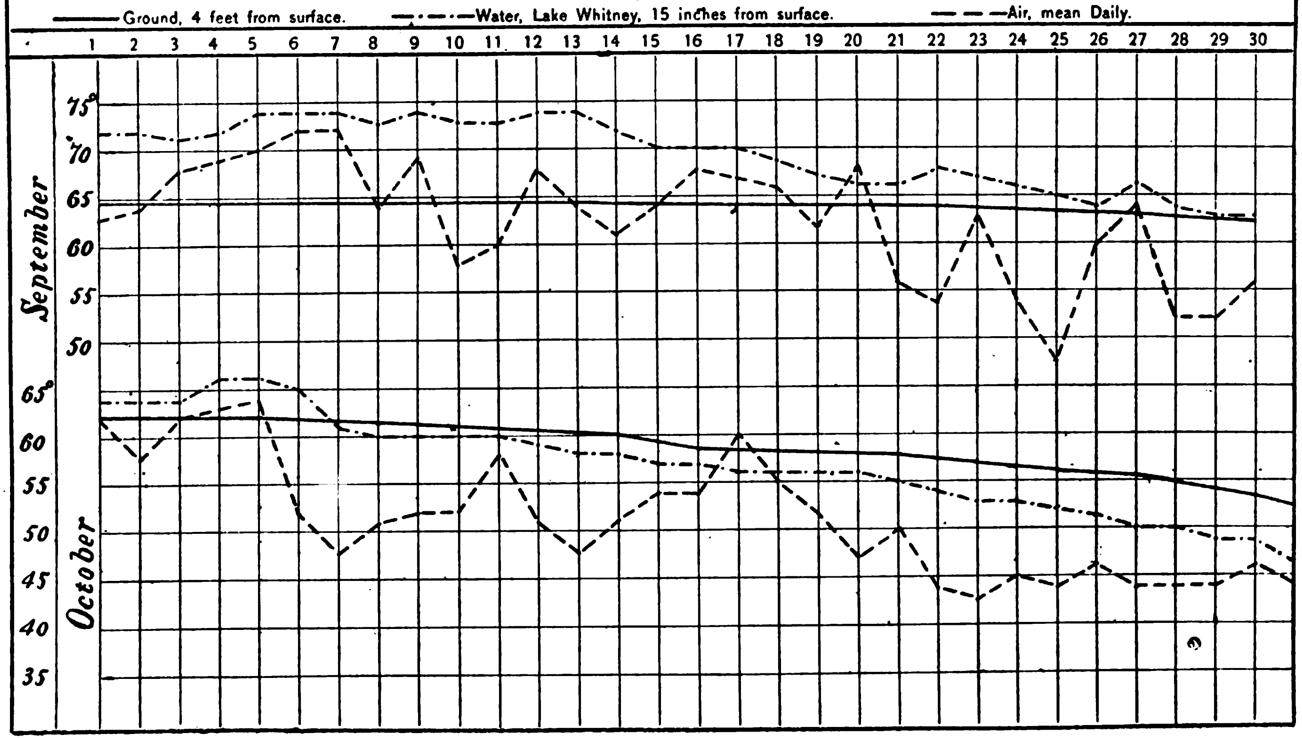
TEMPERATURE CHART.
Ground, 4 feet from surface.
Water, Lake Whitney, 15 inches from surface.
Air, mean Daily.
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30
March
55 50 45 40 35 30 25 20 15
April
60° 55 50 45 40 35

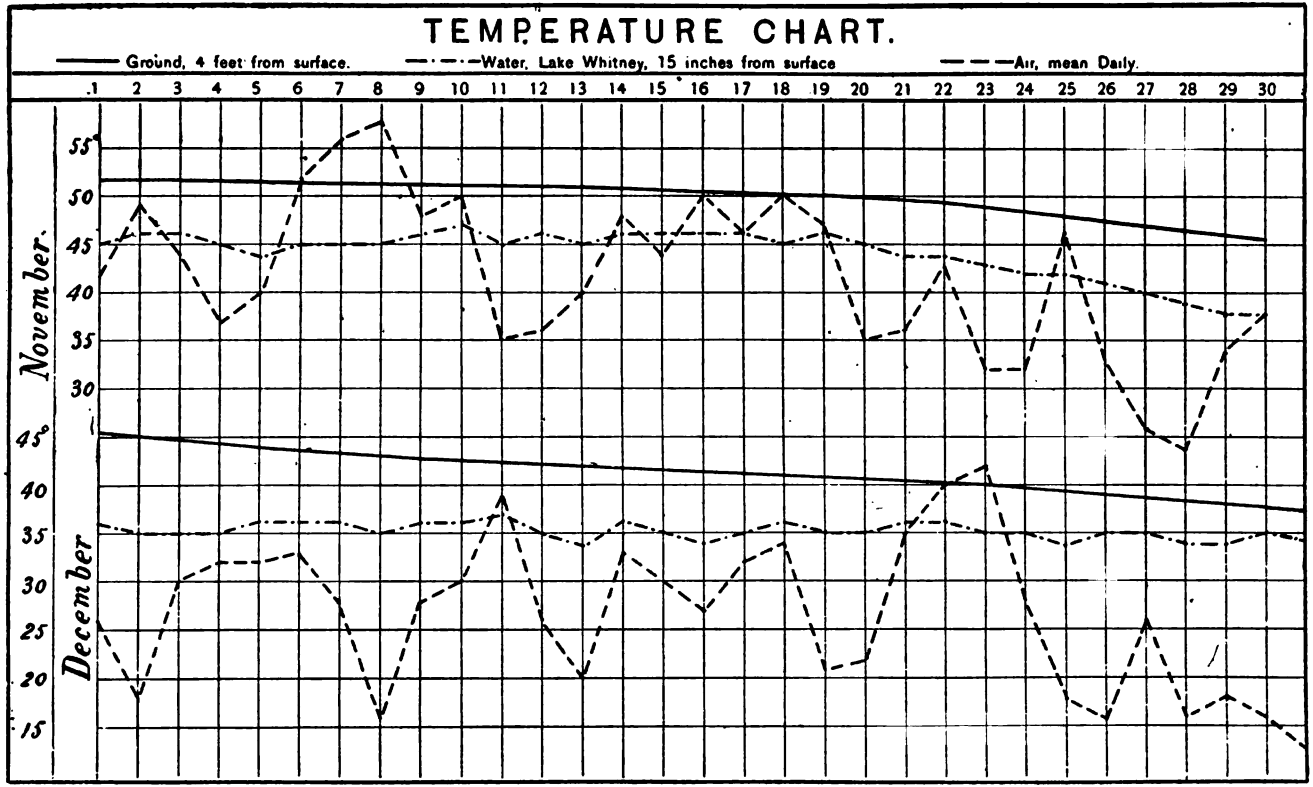

TEMPERATURE CHART.
Ground, 4 feet from surface.
Water, Lake Whitney, 15 inches from surface.
Air, mean Daily.
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30
May
65°
60
55
50
45
June
75°
70
65
60
55
50

TEMPERATURE CHART.



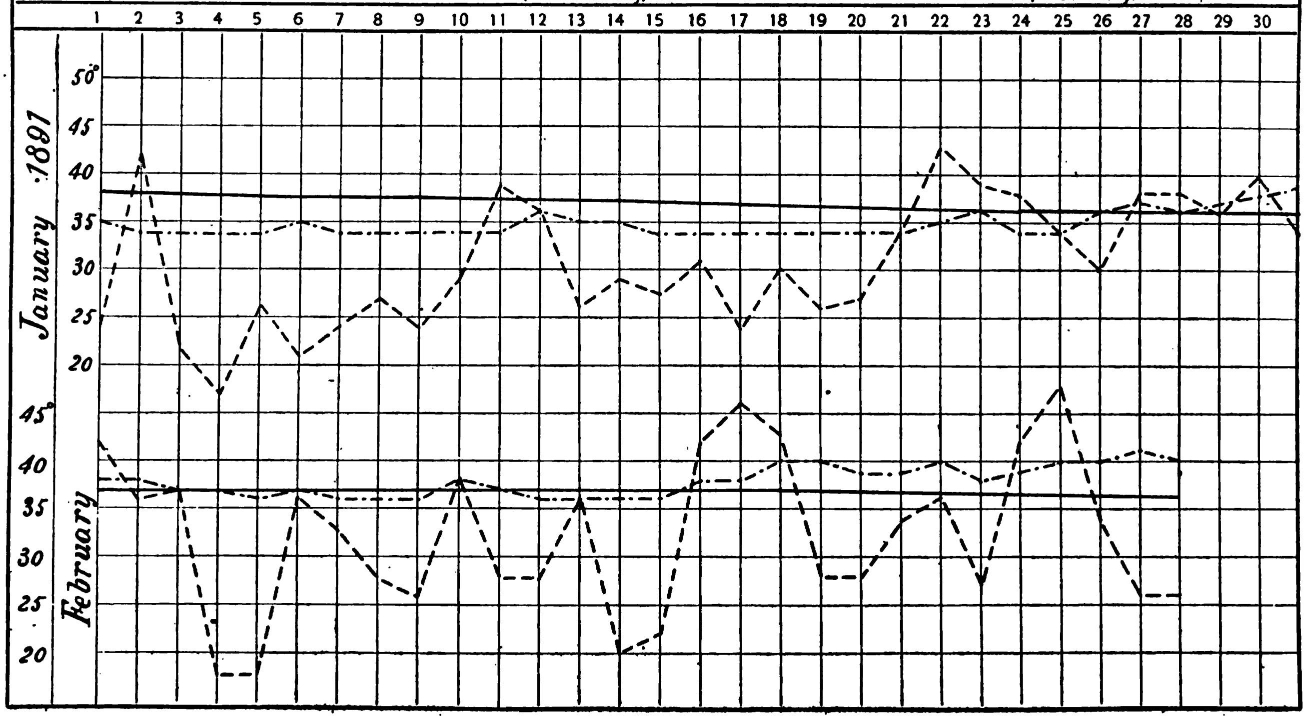
TEMPERATURE CHART.

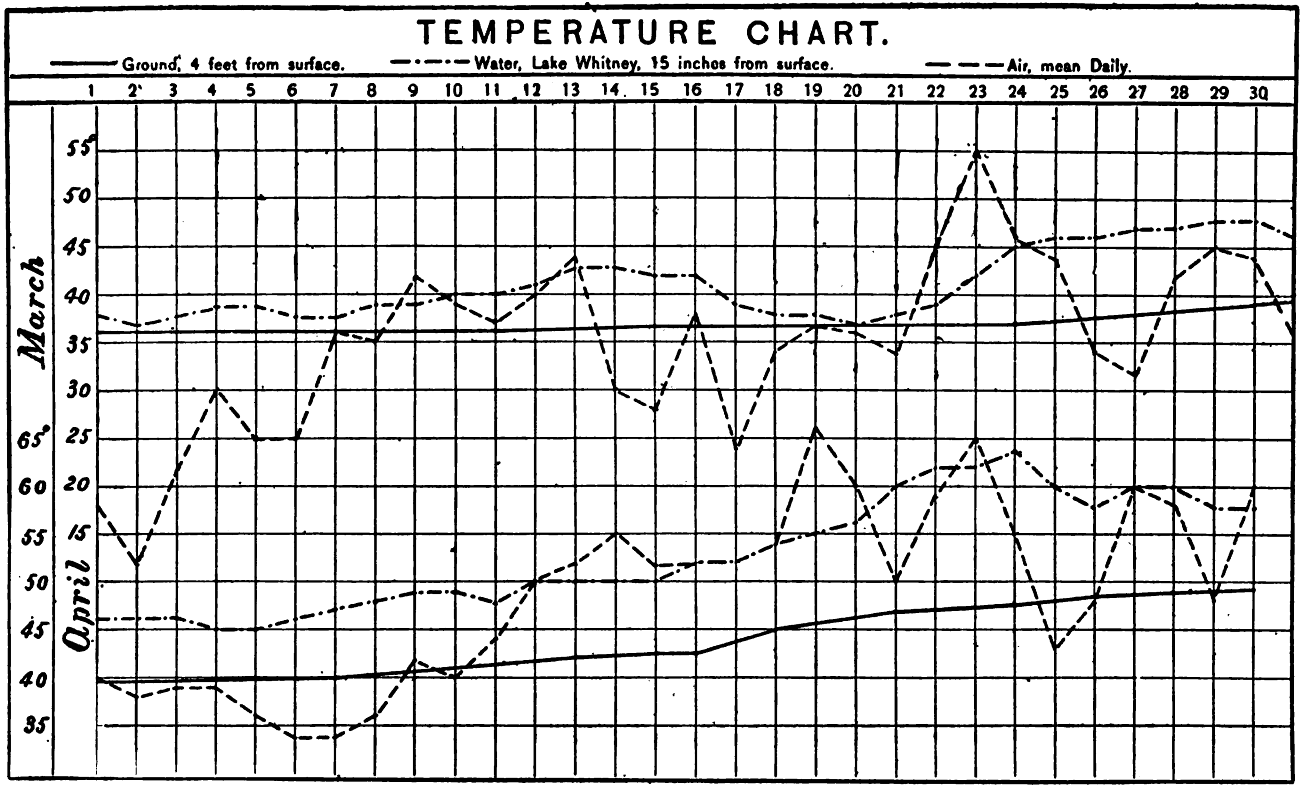


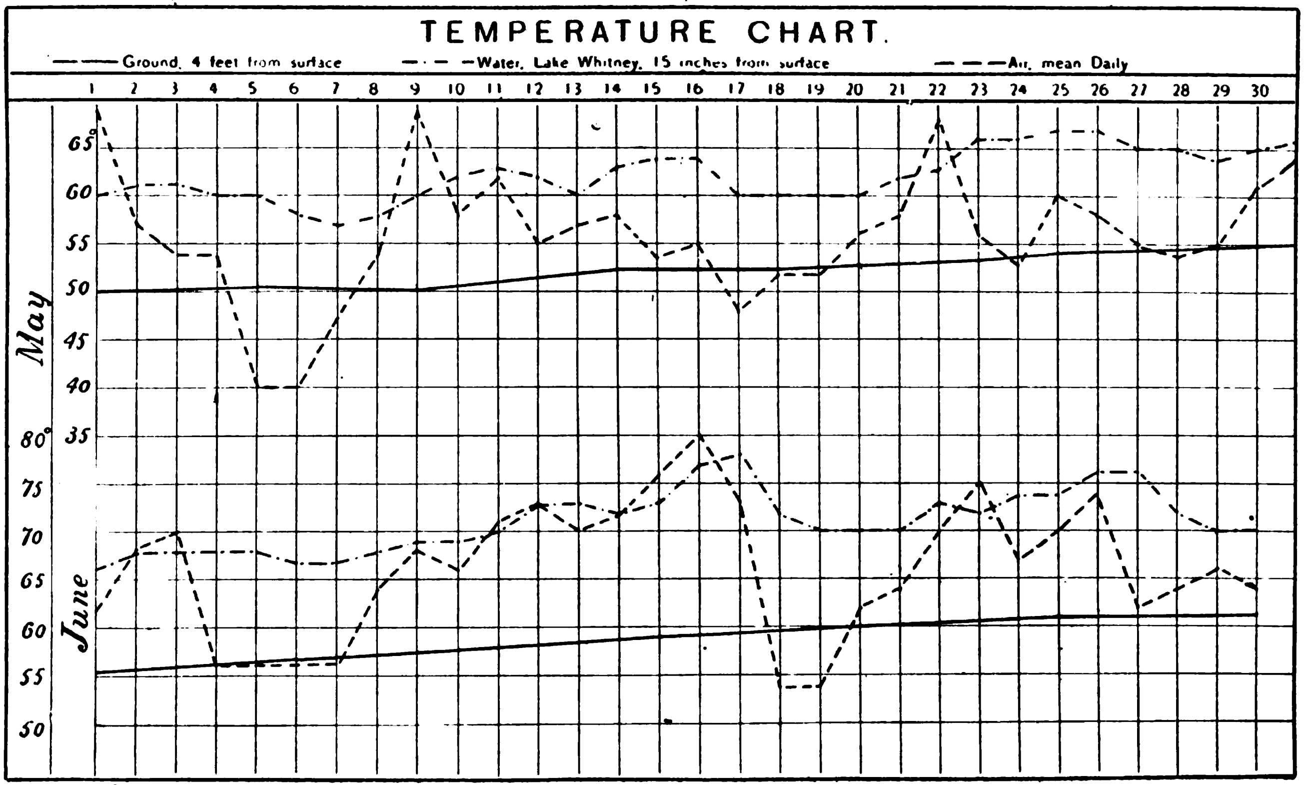

TEMPERATURE CHART.
Ground, 4 feet from surface.
Water, Lake Whitney, 15 inches from surface
Air, mean Daily.
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30
November.
55° 50 45 40 35 30
December
45° 40 35 30 25 20 15

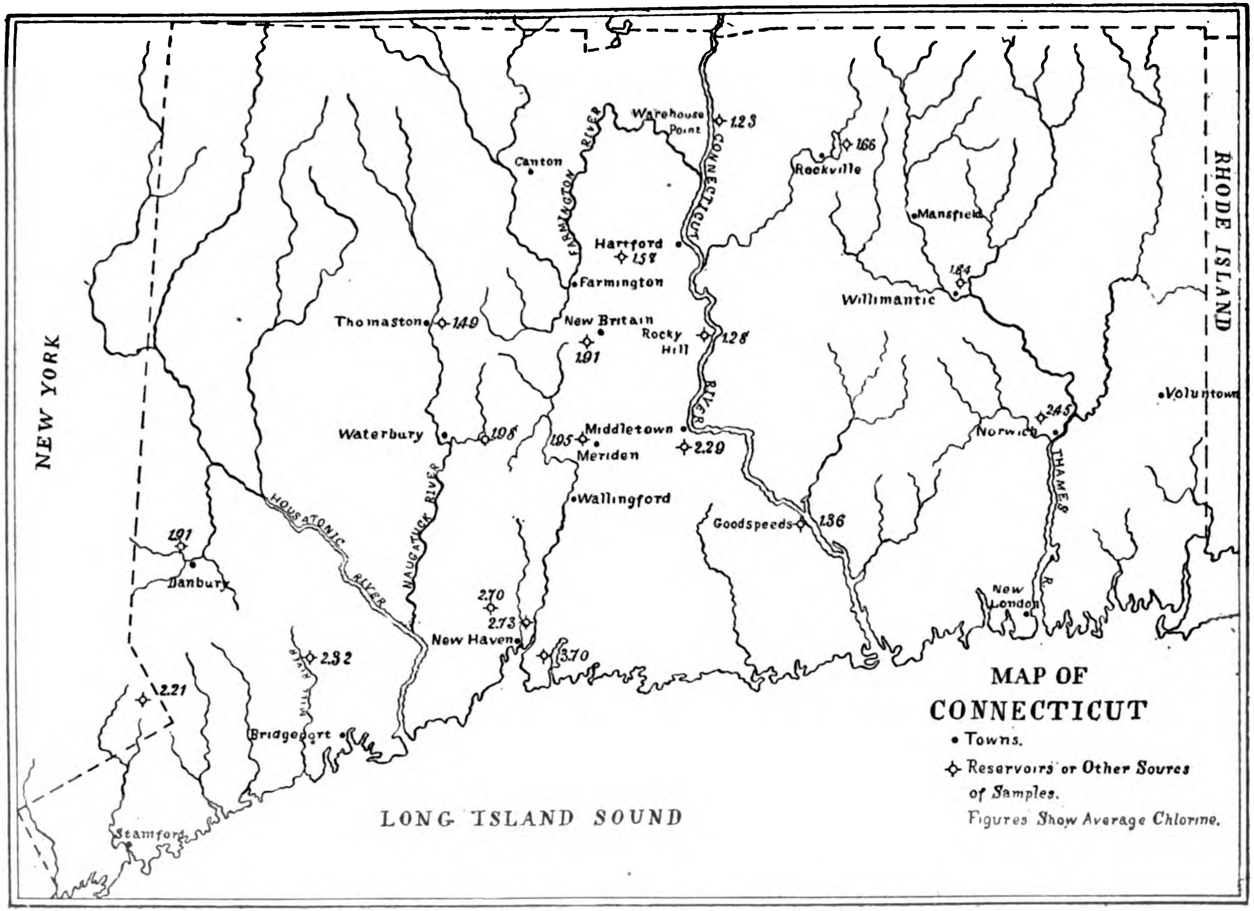
TEMPERATURE CHART.

——Ground, 4 feet from surface. —·—·—Water, Lake Whitney, 15 inches from surface. — — —Air, mean Daily.




TEMPERATURE CHART.
Ground, 4 feet from surface.
Water, Lake Whitney, 15 inches from surface.
Air, mean Daily.
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30
March
55° 50 45 40 35 30 25 20 15
April
65° 60 55 50 45 40 35


TEMPERATURE CHART.
Ground, 4 feet from surface
Water, Lake Whitney, 15 inches from surface
Air, mean Daily
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30
May
65° 60 55 50 45 40 35
June
80° 75 70 65 60 55 50


MAP OF
CONNECTICUT
• Towns.
Reservoirs or Other Soures of Samples.
Figures Show Average Chlorine.
NEW YORK
RHODE ISLAND
LONG ISLAND SOUND
CONNECTICUT RIVER
FARMINGTON RIVER
HOUSATONIC RIVER
NAUGATUCK RIVER
THAMES R.
MILL RIVER
Warehouse Point
1.23
Canton
Hartford
1.58
Farmington
New Britain
1.91
Rocky Hill
1.28
Rockville
1.66
Mansfield
Willimantic
1.84
Voluntown
Norwich
2.45
Thomaston
1.49
Waterbury
1.98
Middletown
Meriden
1.95
2.29
Wallingford
Goodspeeds
1.36
Danbury
1.91
New Haven
2.70
2.73
3.70
2.32
2.21
Bridgeport
Stamford
New London

THE ANALYSES.

The results obtained in the chemical and biological examinations of each reservoir, are here given together, accompanied by brief descriptions of the water supplies of the several cities and towns. The data concerning the consumption of water and the general features of the reservoirs, were obtained chiefly from the officers in charge of the water works, in response to a circular sent to them in 1889. The figures for population are according to the census of 1890.

The location of the several reservoirs examined, and the towns mentioned in this report, are shown on the map on the preceding page. For an explanation of the figures on this map referring to average chlorine, one is referred to the remarks on chlorine in the report on the chemical examinations which follows the charts.

The order in which the analyses are reported is as follows:

(1). HARTFORD.
(2). NEW BRITAIN.
(3). MERIDEN.
(4). MIDDLETOWN.
(5). NEW HAVEN.
(6). ROCKVILLE.
(7). WILLIMANTIC.
(8). NORWICH.
(9). THOMASTON.
(10). WATERBURY.
(11). BRIDGEPORT.
(12). DANBURY.
(13). STAMFORD.

The charts, showing certain results of the examinations in a graphical manner, follow the same order, but for convenience in comparing them, the chemical and the bacteriological charts are grouped separately.

(1). HARTFORD.

Population, 53,230 (city). Average daily consumption of water, 5,000,000 gallons. Works are owned by the city. The sources of supply are, a system of storage reservoirs, and the Connecticut River. A steam pumping station was established in 1854 on the Connecticut River, from which water was raised to a distributing reservoir of 8,000,000 gallons, situated on Asylum Hill. This supply is now used only in case of necessity, and was not in use during the present investigation.

The gravity system consists of five storage reservoirs situated five to six miles west of the city, four in West Hartford and one in Farmington. These works were begun in 1865 and reached their present form in 1887. The reservoirs are so arranged that they may be used separately. They have a capacity of 600,000,000, 285,000,000, 145,000,000, 145,000,000 and 95,000,000 gallons, the aggregate capacity being therefore 1,270,000,000 gallons.

The water is collected from small streams and directly from the adjacent watersheds, the total area of which is about eleven square miles. They are composed of rocky pasture and woodland and are quite free from house drainage. The distributing mains are cast iron, wrought iron and cement pipes. The service pipes are of galvanized iron. Portions of the towns of West Hartford and Wethersfield are supplied from the Hartford reservoirs.

The first set of samples was taken directly from reservoir No. 2, but as satisfactory arrangements could not be made for securing subsequent samples from this place, they were taken on or about the first of each month from a tap at the State Capitol, and were furnished by the courtesy of the superintendents, Messrs. Wm. Dibble and F. Goebel. The samples analyzed, therefore, came from the different reservoirs as it chanced. They were also taken after the long passage through the mains to the city, and at a point where the water is drawn irregularly. The marked turbidity and the noticeable amount of debris of these samples may doubtless be attributed to these facts.

ANALYSES OF HARTFORD WATER SUPPLY.

Samples taken from a tap at the Capitol.

CHEMICAL EXAMINATION, 1889-90.

Figures indicate milligrams per liter, or parts per million. Water filtered through paper.

Date.	Color.	Residue on Evaporation. Total at 100° C.	Loss on Ignition.	Fixed.	Chlorine.	Nitrogen. Of Free Ammonia.	Of Albuminoid Ammonia.	Organic.	Of Nitrites.	Of Nitrates.
Aug. 5	0.5	65.5	22.5	43.0	1.50	0.016	0.240	0 524	0.000	0.02
Sept. 2	.1	67.0	18.0	49.0	1.00	.012	.142	.234	.000	.02
Oct. 5	.1	67.0	5.5	61.5	1.75	.020	.142	.220	.001	.03
Nov. 2	.1	72.0	6.5	65.5	1.75	.016	.122	.264	.002	.03
Dec. 2	.1	53.5	9.5	44.0	1.50	.020	.110	.160	.000	.04
Jan. 7	.2	62.5	7.0	55.5	1.75	.022	.078	.118	.002	.12
Feb. 3	.0	60.0	7.0	53.0	1.75	.024	.100	.142	.002	.16
Mar. 3	.0	54.5	7.0	47.5	1.63	.006	.086	.180	.000	.04
Apr. 1	.0	51.5	9.5	42.0	1.38	.016	.092	.124	.000	.12
May 1	.2	56.0	7.0	49.0	1.50	.032	.098	.158	.000	.12
June 2	.1	54.5	10.0	44.5	1.75	.024	.168	.250	.000	.03
July 3	.1	59.0	7.0	52.0	1.50	.020	.164	.208	.000	.02
Average	.1	60.3	9.7	50.6	1.56	.019	.129	.215	.0006	.06

CHEMICAL EXAMINATION, 1890-91.

Figures indicate milligrams per liter, or parts per million. Water filtered through paper, except as noted.

Date.	Color.	Residue on Evaporation. Total at 100° C.	Loss on Ignition.	Fixed.	Chlorine.	Nitrogen. Of Albuminoid Ammonia.	Of Free Ammonia not filtered.	Of Album'd Ammonia not filtered.	Of Nitrites.	Of Nitrates.	Hardness as $CaCO_3$.	Oxygen consum'd from Permanganate ½ h. at 100° C.
Aug. 1	0.10	55.5	10.5	45.0	1.38	0.146	0.008	0.150	0.002	0.09	24.	2.45
Sept. 2	.40	58.5	7.0	51.5	1.75	.136	.028	.124	.000	.05	25.	1.75
Oct. 1	.20	60.5	9.5	51.0	1.43	.174	.024	.210	.003	.08	33.	4.10
Nov. 1	.30	58 5	6.0	52.5	1.75	.144	.012	.212	.002	.08	34.	4.65
Dec. 1	.20	64 0	11.0	53.0	1.88	.172	.020	.230	.000	.05	33.	5.65
Jan. 2	.20	60.0	7.5	52.5	1.95	.198	.026	.224	.000	.12	32.	6.55
Feb. 2	.10	51.5	8.0	43.5	1.50	.116	.046	.154	.003	.12	24.	3.65
Mar. 2	.05	48.0	6.0	42.0	1.30	.116	.040	.142	.001	.10	23	3.20
Apr 1	.05	36.5	5.5	31.0	1.25	.080	.008	.128	.000	.09	22.	2.65
May 1	.10	52.5	7.5	45 0	1.75	.152	.036	.172	.000	.01	23.	3.25
June 1	.10	53.0	8.5	44.5	1.50	.136	.014	.248	.000	.04	18.	3.90
Average	.16	54.4	7.9	46.5	1.59	.143	.024	.181	.0009	.08	26.	3.80

REMARKS.—The odor was usually little or none, but during the winter and spring of 1890-91 it possessed a stale, vegetable odor. The samples were generally recorded as turbid from fine suspended matter. The sediment generally present was described as scanty, moderate or considerable, flocculent and yellowish or brownish.

MICROSCOPICAL EXAMINATION, 1889-90.

Figures show average organisms per cubic centimeter.

September—Large quantities of debris; a few diatoms, Anabæna and Protococcaceæ.

October—Large quantities of debris; a few diatoms, Anabæna, Protococcaceæ and Conferva.

November—Small quantity of debris; Fragillaria, Asterionella and ? Clathrocystis.

December—Considerable quantities of debris; a few diatoms.

February—Large quantities of yellowish debris; Asterionella (8), Synedra, Tabellaria, Orthosira, Rhaphidium, Dinobryon and three species of infusoria.

March—Considerable debris and fragments of higher plants; Tabellaria, Asterionella (110), Stauroneis, Synedra, Nitzschia (6), and Pandorina.

April—Large quantities of debris; Asterionella (480), Nitzschia (30), Synedra (5), Stauroneis (10), Tabellaria, Gomphonema, Spirogyra filaments (3), Rhaphidium, spores, Eudorina (3), Monostyla, and Dinobryon.

May—Large quantities of debris and fragments of higher plants; Asterionella (250), Orthosira, Nitschia, Difflugia, and Anuræa.

June—Moderate amount of debris; a few diatoms and infusoria.

July—Small amount of debris; Anabæna, Protococcus, Peridineum.

MICROSCOPICAL EXAMINATION, 1890-91.

Figures show average organisms per cubic centimeter of water, * means present in small number.

	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May.	June	July.
DIATOMACEÆ—												
Nitzschia	22	4	27		22	4				37	473	
Asterionella	2		6	4						11		
Orthosira	43	4	14	21	10	4	1		8	48		
Synedra		*		3	4	2						
Tabellaria		*			19	7				30		
Eunotia				4					*			
Navicula									*	2		
CYANOPHYCEÆ—												
Merismopedia	*				2							
Anabæna	21		60									
Sphærozyga			6.1									
Glœocapsa										*		
DESMIDACEÆ—												
Staurastrum			*									
Cosmarium			*									
PROTOCOCCACEÆ—												
Scenedesmus	3			4							8	
Protococcus	9	27	12	17	10	15	7	7	8	12	12	
Rhaphidium		4	4	8	5	*						
Pediastrum			3	3	4	3				2	3	
CONFERVACEÆ—												
RHIZOPODA—												
Actinophrys		6										
Difflugia										*		
INFUSORIA—												
Pandorina	2									2		
Synura	0.4			10						*		
Trachelomonas	4				4	*				*	6	
Dinobryon		6	7			4	6					
Uroglena			9									
Eudorina			*									
Peridineum			3	2					3	2		
Phacus				3								
Euglena										*		
ROTIFERA—												
Anuræa						*	*			*		
CRUSTACEA—												
Cyclops		*									*	

SUMMARY, 1890-91.

	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May.	June	July.
Diatomaceæ	67	8	47	32	55	17	1	----	8	128	473	----
Cyanophyceæ	21	60	----	2	----	----	----	----	----	----	----	----
Desmidiaceæ	----	----	*	----	----	----	----	----	----	----	----	----
Protoccaceæ	12	31	19	32	19	18	7	2	8	14	23	----
Confervaceæ	----	----	----	----	----	----	----	----	----	----	----	----
Rhizopoda	----	6	----	----	----	----	----	----	----	*	----	----
Infusoria	6	6	19	15	4	4	6	----	3	4	6	----
Rotifera	----	----	----	----	----	*	*	----	----	*	----	----
Crustacea	----	*	----	----	----	----	----	----	----	----	*	----

BACTERIOLOGICAL EXAMINATION, 1889-90.

	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June	July.
Average No. bacteria per c. c.	78	133	365	467	590	96	113	330	84	326	72	552
Temperature air monthly mean ° F.*	68	----	48	43.1	----	32.8	35.2	33.4	48	----	----	----
Tot'l precipitation during month in inches †	4.70	3.72	5.10	8.29	2.41	2.25	3.48	6.18	2.92	5.08	3.37	3.83

* From records of the New England Meteorological Bureau.
† From records of rainfall taken at the West Hartford reservoir.

BACTERIOLOGICAL EXAMINATION, 1890-91.

	Aug.	Sept	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June
Average No. bacteria per c. c.	112	468	775	95	73	176	153	147	76	108	226
Temperature air monthly mean ° F.*	----	62.8	49.4	44.6	23.5	28.9	34.6	33.5	49.6	56.9	66.2
Total precipitation during month in inches.†	4.12	4.55	5.86	.80	3.18	8.48	4.27	4.75	3.35	2.	1.92

* From records of the New England Meteorological Bureau.
† From records of rainfall taken at the West Hartford reservoir.

REMARKS.—The forms of bacteria most abundant were a white and green liquefying, pink, bluish white, white irregular, fluorescent, and yellow solid and yellow liquefying colonies were seen.

(2). NEW BRITAIN.

Population, 19,007 (town). Average daily consumption of water, 2,500,000 gallons. The works are owned by the city, and were begun in 1857. The source of water is Shuttle Meadow Lake, an artificial storage reservoir formed by an earth and stone dam across a brook. Its area is 175 acres and its capacity is 700,000,000 gallons. About one-fourth is shallow and supports large growths of water plants. The surface flooded was a swampy, wooded valley and has never been cleaned. In the fall of 1886, the water weir was raised ten inches with the result of very greatly decreasing the growth of the water plants, which have, however, again become abundant. These plants are not systematically removed, but remain in the water. During the warm months, the water supports a very large growth of floating algæ which by their decomposition contaminate the water, and this is much complained of by the consumers. The watershed has an area of about one square mile, and is composed of numerous trap ridges partly covered with timber, with some pasture and farm land.

There is a distributing reservoir supplied from Shuttle Meadow by gravity. Distribution mains are of cast iron and cement. The service pipes are of iron and lead.

Samples for analysis were furnished for two years, on or about the first of each month, by the courtesy of Mr. J. W. Ringrose, chairman of the Board of Water Commissioners. Until September, 1890, they were taken near the gatehouse at Shuttle Meadow, after this date from a tap at the commissioners' office on Main street.

Analyses of New Britain Water Supply.

Samples taken from near gatehouse, Shuttle Meadow Lake, until September, 1891, then from a tap on Main street.

CHEMICAL EXAMINATION, 1889-90.

Figures indicate milligrams per liter, or parts per million. Water filtered through paper.

Date.	Color.	Residue on Evaporation. Total at 100° C.	Loss on Ignition.	Fixed.	Chlorine.	Nitrogen. Of Free Ammonia.	Of Albuminoid Ammonia.	Total Organic.	Of Nitrites.	Of Nitrates.
Aug. 2	0.4	67.0	17.0	50.0	1.25	0.008	0.298	0.472	0.000	0.02
Sept. 4	.0	72.0	20.5	51.5	1.75	.016	.212	.310	.000	.02
Oct. 4	.1	66.0	13.0	53.0	2.00	.010	.182	.370	.000	.04
Nov. 2	.0	66.5	7.0	59.5	1.50	.024	.196	.316	.000	.02
Dec. 2	.0	57.0	10.0	47.0	1.75	.008	.134	.202	.000	.03
Jan. 4	.1	63.0	10.5	52.5	2.25	.044	.154	.296	.002	.04
Feb. 3	.0	55.0	9.0	46.0	2.50	.030	.132	.356	.001	.14
Mar. 3	.0	59.5	8.5	51 0	2.25	.040	.194	.326	.000	.12
Apr. 1	.1	59.0	10.5	48.5	2.50	.020	.178	.270	.000	.06
May 2	.1	57.0	7.5	49.5	2.25	.020	.150	.230	.000	.04
June 3	.0	59.5	9.5	50.0	2.00	.046	.240	.508	.000	.03
July 4	.1	56.5	5.5	51.0	2.00	.026	.130	.268	.000	.00
Average	.08	61.5	10.7	50.8	2.00	.024	.183	.327	.0003	.05

CHEMICAL EXAMINATION, 1890-91.

Figures indicate milligrams per liter, or parts per million. Water filtered through paper, except as noted.

Date.	Color.	Residue on Evaporation. Total at 100° C.	Loss on Ignition.	Fixed.	Chlorine.	Nitrogen. Of Albuminoid Ammonia.	Of Free Ammonia not filt'r'd.	Of Albumin'd Ammonia not filt'r'd.	Of Nitrites.	Of Nitrates.	Hardness as Ca CO_3	Oxyg'n Consum'd from Permanganate ½ h. at 100° C.
Aug. 2	0.10	67.5	12.0	55.5	1.75	0.172	0.014	0.348	0.000	0.02	29.	----
Sept. 2	.05	80.5	18.5	62.0	2.18	.420	.030	1.296	.000	.00	30.	----
Oct. 3	.20	77.5	17.5	60.0	1.75	.234	.028	.470	.000	.08	36.	5.00
Nov. 6	.10	68.0	15.0	53.0	1.80	.190	.018	.306	.002	.03	40.	4.20
Dec. 1	.05	69.5	13.0	56.5	1.75	.216	.058	.242	.000	.02	37.	5.15
Jan. 5	.15	69.0	11.0	58.0	1.68	.198	.246	.198	.000	.05	40.	4.40
Feb. 2	.10	52.5	9.5	43.0	1.88	.150	.120	.150	.001	.04	24.	3.40
Mar. 3	.05	32.0	8.0	24.0	1.55	.136	.140	.176	.001	.09	30.	3.05
Apr. 3	.10	43.0	7.5	35.5	2.00	.142	.036	.236	.001	--	27.	3.20
May 4	.10	46.5	7.0	39.5	1.95	.170	.012	.218	.000	.03	29.	2.85
June 8	.10	48.5	6.0	42.5	1.63	.162	.014	.296	.000	.03	30.	2.90
Average	.10	59.5	11.4	48.1	1.81	.199	.065	.358	.0004	.04	32.	3.79

Remarks.—The odor was sometimes little or none, but was frequently described as disagreeable, swampy, fishy or vegetable. The water was, sometimes, nearly clear, but usually turbid or very turbid from suspended organisms or debris. There was sometimes a very scanty sediment only, but usually it was described as moderate or considerable and light flocculent.

MICROSCOPICAL EXAMINATION. 1889-90. 1890-91.

Figures show average organisms per cubic centimeter of water, * means present in small number. First year in Roman type, second year in full face type.

	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July.
DIATOMACEÆ—												
Asterionella					150	100		20		50	20	2
Pinularia		*										
Cocconema												*
Nitzschia (and	100	250	300	180	270	50		350		1300		2000
Niztschiella)	**85**	**13**		**39**	**22**				**52**	**12**	**15**	
Melosira		*		*	*							
				22								
Orthosira				100	370							
	51	**18**	**21**	**68**	**16**		**4**		**59**	**56**	**52**	
Surirella					*							
Gomphonema											4	
Synedra			**2**	**9**	**4**					**2**		
Navicula			**4**								**4**	
Stauroneis											*	
CYANOPHYCEÆ—												
Clathrocystis		38	20	7	*						*	180
	58	**83**	**13**	**4**						**10**	**13**	
Glœocystis											5	
Anabæna	**48**	**206**	**11**	**6**							**3**	20
Merismopedia			**2**									
Nostoc		30										
DESMIDACEÆ—												
Staurastrum	3	20	10	16	3							120
	*		**2**		**2**							
OTHER ALGÆ—												
Rhaphidium		40	60	100	60			30				
Polyedrium	10	30	30	12								
			2	**3**								
Protococcus	90	90	130	*	*							
	36	**48**	**43**	**13**	**13**	**8**	**18**	**15**	**20**	**26**	**30**	
Scenedesmus	20	25	50	44	10					20	20	
	12	**7**	**10**	**10**	**2**				**24**			
Pediastrum	5	8	12	*	*						2	0.5
		2	*									
Cœlosphærum			5									
Conferva	80	16	35	35	*							1
Volvox (? Uroglena)								*			5	
Spores				6	*	*	*	*				
								30				
ANIMALS—												
Actinophrys										*		
Amœba										*		
Difflugia										*		
Anuræa											*	5
	*	**5**					**2**	**4**	*	*	**6**	
Cyphodera										*		
Peridineum										8		
	2								**3**	**37**	**23**	
Ceratium		*	*									30
	7										**2**	
Trachelomonas		*										
	4		**2**	**7**	**5**			**14**	**5**	**4**	**6**	
Asplanchna										2		
Ophryoglena								*		0.5		

	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May.	June	July.
Dinobryon	....	10	*	*	30	20	....	150	*	*	100	....
	....	....	....	....	....	....	**29**	**81**	....	....	**22**	....
Euglena	*	*	....	....	....	....	*	....	....	....	*	....
	....	....	....	....	**7**	....	....	....	....	**3**	....	....
Uroglena	....	....	....	....	....	....	....	....	....	....	....	**2**
Synura	**4**	....	....	....	**4**	....	....	....	....	....	....	....
Eudorina	*	....	....	....	....	....	....	....	....	....	....	**1**
Pandorina	*	....	*	....	....	....	....	*	....	....	....	....
Eosphora	....	....	....	....	....	....	....	....	....	....	....	*
Polyarthra	....	....	....	....	....	....	....	....	....	....	....	**1**
Vorticella	....	....	....	....	....	....	....	....	....	....	....	....
Monocerca	....	....	....	....	....	....	....	....	....	....	1	....
Chlamydomonas	....	....	*	....	....	....	....	....	....	....	....	....
Cyclops	*	....	....	....	....	....	....	*	....	....	....	....
	*	....	....	....	....	....	....	*	....	....	....	*

SUMMARY.

	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May.	June	July.
Diatomaceæ	100	250	300	280	690	150	....	370	....	1350	28	2002
	136	**31**	**27**	**138**	**42**	....	**4**	....	**111**	**70**	**67**	....
Cyanophyceæ	....	68	20	7	*	....	....	....	....	....	*	200
	106	**289**	**26**	**10**	**7**	....	....	....	....	**10**	**16**	....
Desmidaceæ	3	20	10	16	3	....	....	....	....	....	....	....
	*	....	**2**	....	**2**	....	....	....	....	....	....	120
Protococcaceæ	125	193	282	156	70	....	....	30	....	....	....	....
	48	**57**	**55**	**26**	**20**	**8**	**18**	**15**	**44**	**26**	**30**	....
Conferva	80	16	35	35	*	....	....	....	....	....	....	1
Rhizopoda	....	....	....	....	....	....	....	....	....	*	....	....
Rotifera	....	....	....	....	....	....	....	....	....	....	1	6
	*	**5**	....	....	....	....	**2**	**4**	*	*	**6**	....
Infusoria	....	10	*	*	30	20	....	150	*	11	100	60
	17	**5**	**2**	**7**	**16**	....	**31**	**99**	**53**	**46**	**58**	....
Crustacea	*	....	....	....	....	....	....	*	....	....	....	....
	*	....	....	....	....	....	....	....	....	....	....	*

Remarks for the Year ending July, 1890.

November—Considerable flocculent debris, with much rusty-colored floating material.
January—Considerable debris.
February—Numerous inorganic particles and fragments of higher plants.
March—Numerous fragments of higher plants.
April—Moderate amount of debris.
May—Moderate amount of debris.
June—Large quantities of fragments, debris and sediment.
July—Clathrocystis partly dead and collected in masses, showing an extraordinary quantity of flocculent material to the eye. Anabæna in coiled spirals of from 50 to 100 cells.

Note.—The examination for February, 1890, is incomplete. Clathrocystis, and perhaps also, Anabæna, were probably present in August, 1889; their habit of floating was not discovered till the following month.—S. W. W.

BACTERIOLOGICAL EXAMINATION. 1889-90.

	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.
Average No. bacteria per c. c.	97	219	346	216	202	2180	509	460	738	1186	80	....
Temperature water at time of collection, ° F.	75	74	62	50	38	36	32	36	40	....	....	72
Total precipitation during month in inches*	4.32	5.50	5.02	8.40	2.85	2.40	3 69	6.05	2.38	5.09	2.82	4.36

* From rainfall records at Farmington.

BACTERIOLOGICAL EXAMINATION. 1890-91.

	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.
Average No. bacteria per c. c.	120	520	572	291	66	69	249	156	45	137	493
Total precipitation during month in inches*	3.75	4.43	7.06	.62	4.36	10.32	4.96	5.95	3.25	1.92	1.46

* From rainfall records at Farmington.

REMARKS.—The bacteria most frequent and abundant were green and white liquefying and a white solid. There were found at various times pink solid, bluish white solid and yellow liquefying forms.

ADDITIONAL ANALYSES OF NEW BRITAIN SAMPLES.

CHEMICAL EXAMINATION.

Figures indicate milligrams per liter, or parts per million.

	Date.	Color.	Residue on Evaporation. Total at 100° C.	Loss on Ignition.	Fixed.	Chlorine.	Nitrogen. Of Free Ammonia.	Of Albuminoid Ammonia.	Of Free Ammonia not filtered.	Of Album'd Ammonia not filtered.
	1891									
N.Britain Res.	Aug.12	0.1	76.0	20.0	56.0	....	0.006*	0.164*	0.002	0.508
N.Britain Res.	Aug.20	.1	87.0	34.0	53.0	1.75	.038*	.196*	.040	.622
N. Britain Tap	Sept. 2	.1*	81.0*	21.5*	59.5*	2.00*	.028*	.336*	.030	1.038

* Filtered through paper.

(3). MERIDEN.

Population, 21,652 (city). Average daily consumption of water, 1,000,000 gallons. The supply comes from an artificial storage reservoir of a capacity of 360,000,000 gallons, which was constructed by the city in 1869, by building two earth dams between two high trap ridges, one mile from the city and 250 feet above it.

The watershed has an area of six to eight hundred acres, and is rocky woodland with no pastures or dwelling houses. Two canals extending east and west lead the water into the reservoir. The reservoir is mostly deep with rocky banks, but there is some swampy shore, and about one-tenth is shallow flowage. This induces a production of water plants, and during the warm months there is usually an abundant growth of floating algæ.

The distributing mains are of cast iron and cement pipes. The service pipes are of galvanized iron.

Samples for analysis were taken on the first of each month during two years, from the gatehouse, and were furnished by the courtesy of the superintendents, Messrs. J. B. Dunlop and H. L. Schleiter.

Analysis of Meriden Water Supply.

Samples were taken at the gatehouse.

CHEMICAL EXAMINATION, 1889-90.

Figures indicate milligrams per liter, or parts per million. Water filtered through paper.

Date.	Color.	Residue on Evaporation. Total at 100° C.	Loss on Ignition.	Fixed.	Chlorine.	Nitrogen. Of Free Ammonia.	Of Albuminoid Ammonia.	Organic.	Of Nitrites.	Of Nitrates.
Aug. 2..	0.8	45.5	12.0	33.5	1.50	0.018	0.176	0.362	0.000	0.02
Sept. 2..	.1	72.0	20.0	52.0	2.00	.022	.396	.664	.000	.02
Oct. 4..	.0	48.5	11.0	37.5	2.00	.012	.154	.288	.004	.09
Nov. 5..	.0	50.5	9.0	41.5	1.75	.014	.100	.196	.000	.06
Dec. 2..	.0	40.5	6.5	34.0	2.00	.018	.086	.132	.000	.07
Jan. 3..	.1	39.5	7.0	32.5	1.75	.014	.086	.146	.002	.04
Feb. 13..	.0	38.5	6.0	32.5	2.00	.018	.110	.208	.002	.04
Mar. 3..	.0	39.0	7.0	32.0	2.38	.006	.086	.210	.000	.14
Apr. 1..	.0	37.0	8.0	29.0	1.88	.012	.122	.178	.000	.04
May 1..	.0	35.0	5.0	30.0	2.25	.018	.084	.141	.000	.02
June 2..	.0	43.5	9.0	34.5	1.75	.024	.100	.190	.000	.03
July 2..	.0	44.5	7.5	37.0	2.00	.046	.104	.148	.002	.00
Average	0.04	44.5	9.0	35.5	1.94	.019	.134	.239	.0008	.05

CHEMICAL EXAMINATION, 1890-91.

Figures indicate milligrams per liter, or parts per million. Water filtered through paper, except as noted.

Date.	Color.	Residue on Evaporation. Total at 100° C.	Loss on Ignition.	Fixed.	Chlorine.	Nitrogen. Of Albuminoid Ammonia.	Of Free Ammonia not filtered.	Of Album'd Ammonia not filtered.	Of Nitrites.	Of Nitrates.	Hardness as $CaCO_3$.	Oxygen consum'd from Permanganate ½ h. at 100° C.
Aug. 1...	0.00	37.5	7.5	30.0	1.81	0.152	0.028	0.154	0.000	0.02	20.	1.15
Sept. 1...	.05	48.0	7.5	40.5	2.12	.118	.024	.350	.000	.00	18.	1.25
Oct. 1...	.10	48.0	12.0	36.0	1.90	.160	.124	.182	.002	.20	20.	2.04
Nov. 1...	.10	41.5	6.0	35.5	1.83	.080	.036	.090	.002	.06	21.	2.10
Dec. 1...	.05	40.5	7.0	33.5	2.00	.076	.012	.098	.000	.05	18.	2.30
Jan. 2...	.05	40.5	6.0	34.5	2.05	.100	.020	.108	.000	.08	22.	2.70
Feb. 2...	.05	28.5	6.0	22.5	2.13	.082	.008	.086	.000	.04	9.	2.45
Mar. 2...	.05	33.5	6.0	27.5	1.88	.094	.020	.100	.000	.06	13.	2.25
Mar. 31...	.00	29.0	6.0	23.0	1.45	.082	.016	.106	.000	.12	17.	1.95
May 1...	.00	29.5	4.5	25.0	2.40	.110	.010	.134	.000	.02	16.	1.65
June 1...	.00	32.0	5.0	27.0	2.05	.072	.006	.096	.000	.00	18.	1.40
Average .	.04	37.1	6.7	30.4	1.97	.102	.028	.137	.0003	.06	17.	1.93

Remarks.—The odor was usually little or none, but in four samples was recorded as peculiar and disagreeable. Usually nearly clear, but on several occasions was turbid from suspended organisms. The sediment was usually scanty.

MICROSCOPICAL EXAMINATION, 1889-90. 1890-91.

Figures show average organisms per cubic centimeter of water. * means present in small number. First year in Roman type, second year in full face type.

	Aug.	Sept.	Oct. 4.	Oct. 29.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July
DIATOMACEÆ—													
Asterionella	6			200	50	220	550	250	400	45	450	50	120
	17								*	**6**	**94**	**380**	
Synedra				*					*				
	*	**7**	**8**		*								
Navicula			*							*			
Pinnularia			*										
	*												
Stauroneis						*							
Tabellaria				*	3	8	10	*	*	*		170	6
	31	**33**	**11**		**47**	**23**	**19**		*		**38**	**286**	
Nitzschia	4		200	50	40								20
	42	**35**			**352**	**62**			**7**			**155**	
Orthosira					2								10
		35	**18**		**21**		**7**						
Melosira			42										
Gomphonema		*											
CYANOPHYCEÆ—													
Clathrocystis			2										
	*												
Glœocapsa											*		
Anabæna	200	650	2										
	175	**59**											
Merismopedia	*		*										
DESMIDACEÆ—													
Staurastrum			1	*		*							**1**
	*												
Docidium			2										
Cosmarium				*								1	
	*												
Sorastrum	*												
OTHER ALGÆ—													
Pediastrum	*	*											0.5
		*											
Scenedesmus	*	*									*		
Protococcus	10	20		60				50	42	*	150		100
	39	**155**	**12**		*	**9**	*	**12**	**22**	**19**	**17**	**16**	
Conferva	1	250	3	*	4	.5							
		*											
Spores							10						
ANIMALS—													
Actinophrys			*										
									5				
Difflugia				10	4	1	*			*			
										4		*	
Anuræa			*	9							*	1	*
	*									*	*	*	
Epistylis												*	
Peridineum			14			16		2	6	14	2		
			*			*	*	*		**18**			
Trachelomonas		**5**	*										
Dinobryon				200	11	170	250	190	400	40			
	22	*	**22**		**14**				**15**				
Pandorina			4	*								*	
		*	*									*	

	Aug.	Sept.	Oct. 4.	Oct. 29.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July
Uroglena	----	----	----	21	25	2	----	----	----	----	----	----	----
	----	*	----	----	**17**	----	----	----	----	----	----	----	----
Volvox	----	----	*	----	----	----	----	----	----	----	----	----	----
Euglena	----	----	1	----	----	----	----	----	----	----	----	----	----
Phacus	----	----	----	----	----	----	----	----	----	*	----	----	----
Chlamydomonas	----	----	25	----	----	----	----	----	----	----	----	----	----
	----	*	----	----	----	----	----	----	----	----	----	----	----
Ceratium	----	----	*	----	----	----	----	----	----	----	----	----	----
Polyarthra	----	----	----	----	----	----	----	----	----	----	----	1	----
	----	----	----	----	----	----	----	----	----	----	*	----	----
Cyclops	----	----	----	1	*	*	----	----	----	----	----	----	----
	*	*	----	----	----	----	----	----	----	----	----	----	----

SUMMARY.

	Aug.	Sept.	Oct. 4.	Oct. 29.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July
Diatomaceæ	6	----	242	250	95	228	560	250	400	45	450	220	180
	90	**110**	**37**	----	**420**	**85**	**26**	----	**7**	**6**	**132**	**821**	----
Cyanophyceæ	200	650	4	----	----	----	----	----	----	----	----	----	----
	175	**59**	*	----	----	----	----	----	----	----	*	----	----
Desmidaceæ	----	----	3	----	----	----	----	----	----	----	----	1	1
	*	*	----	----	----	----	----	----	----	----	----	----	----
Protococcaceæ	10	20	----	60	----	----	----	50	42	----	150	----	100
	39	**155**	**12**	----	*	**9**	*	**12**	**22**	**19**	**17**	**16**	----
Conferva	1	2	3	----	4	0.5	----	----	----	----	----	----	----
	----	*	----	----	----	----	----	----	----	----	----	----	----
Rhizopoda	----	----	*	10	4	1	----	----	----	----	----	----	----
	----	----	----	----	----	----	----	----	**5**	**4**	----	----	----
Rotifera	----	----	----	9	----	----	----	----	----	----	*	2	*
	*	----	*	----	----	----	----	----	----	*	*	*	----
Infusoria	----	----	44	220	36	174	250	192	406	514	2	*	----
	22	**5**	**22**	----	**31**	*	*	*	**15**	**18**	----	*	----
Crustacea	----	----	----	1	*	*	----	----	----	----	----	----	----
	*	*	----	----	----	----	----	----	----	----	----	----	----

Remarks for the Year ending July, 1890.

September—Filaments of Anabæna, averaging one millimeter in length, mostly in divisional stage.

October 4—Considerable yellow debris, Clathrocystis and Anabæna mostly broken.

December—Much inorganic sediment.

February—Numerous fragments of higher plants.

March—Fragments of higher plants.

April—Numerous inorganic particles and some fragments of higher plants.

May—Numerous fragments of higher plants.

June—Numerous fragments of higher plants.

July—But little debris.

BACTERIOLOGICAL EXAMINATION, 1889-90.

	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July
Average No. bacteria per c. c.	248	936	1418	226	6965	118	552	696	290	465	102	233

BACTERIOLOGICAL EXAMINATION, 1890-91.

	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
Average No. bacteria per c. c.	218	498	1482	259	834	103	241	211	125	97	459

REMARKS.—The more abundant and frequently seen bacteria were a white solid and liquefying and a pink solid; a green and yellow liquefying were also seen.

No records of rainfall or temperature could be obtained.

ADDITIONAL ANALYSES OF MERIDEN SAMPLES.

CHEMICAL EXAMINATION.

Figures indicate milligrams per liter, or parts per million. Water filtered through paper.

	Date.	Color.	Residue on Evaporation.			Chlorine.	Nitrogen.			
			Total at 100° C.	Loss on Ignition.	Fixed.		Of Free Ammonia.	Of Albuminoid Ammonia.	Of Nitrites.	Of Nitrates.
	1889.									
Tap in city	Oct. 25	0.1	45.0	6.5	38.5	1.84	0.022	0.088	0.002	0.09
	1890.									
Black Pond*	May 1	0.1	51.0	8.5	42.5	2.25	.026	.156	.000	.02
" " *	Sept. 1	....	63.0	17.5	45.5	2.20	.026	.242	.000	.03

* Proposed new supply.

(4). MIDDLETOWN.

Population, 9,013 (city). Average daily consumption of water is 800,000 gallons. The supply comes from an artificial storage reservoir constructed by the city in 1856. The earthen dam was built across a small ravine, the surface of which was mostly a wet and boggy meadow. A part was a swamp covered with bushes and trees, which were cut, but the surface soil was not removed, except such as was used in the construction of the dam. The watershed has an area of 1.05 square miles and is mostly open pastureland and orchards, with very little woodland. There is no house drainage. The area of the reservoir is 72 acres and its capacity is 220,000,000 gallons. Its greatest depth is 16 feet, its average depth is 10 feet, but about 8 acres of it does not exceed 4 feet in depth.

The water is shallow near the shores, but these are free from bushes, as a dike and driveway extend all around the reservoir. Water plants grow freely over a large extent of shallow water, which for two years have been systematically removed by means of a long rope and net, as soon as they attained their growth. During the summer of 1890, there were removed 250 cart loads, and in 1891, 350 cart loads of these plants, which were found to consist of *Anacharis Canadensis* and several species of *Potamogeton* and *Conferva.* The reservoir also supports large growths of floating algæ.

Samples for analysis were taken a few feet from the dam and were promptly forwarded to us on the first of the month during two years, by the superintendent, Major J. C. Broatch.

Distributing mains are of cast iron, wrought iron and cement. The service pipes are of galvanized iron and wrought iron lined with cement.

Analysis of Middletown Water Supply.

Samples taken from the Reservoir near the Dam.

CHEMICAL EXAMINATION, 1889-90.

Figures indicate milligrams per liter, or parts per million. Water filtered through paper.

Date.	Color.	Residue on Evaporation. Total at 100° C.	Residue on Evaporation. Loss on Ignition.	Residue on Evaporation. Fixed.	Chlorine.	Nitrogen. Of Free Ammonia.	Nitrogen. Of Albuminoid Ammonia.	Nitrogen. Organic.	Nitrogen. Of Nitrites.	Nitrogen. Of Nitrates.
Aug. 2	0.3	47.0	15.0	32.0	2.00	0.240	0.202	0.380	0.000	0.02
Sept. 2	.0	54.5	18.5	36.0	2.25	.080	.236	.426	.000	.05
Oct. 4	.1	45.0	8.0	37.0	2.25	.118	.180	.322	.003	.07
Nov. 2	.0	46.0	7.0	39.0	2.50	.054	.184	.322	.005	.10
Dec. 2	.0	40.5	9.0	31.5	2.50	.038	.144	.232	.000	.16
Jan. 3	.1	41.0	6.0	35.0	2.25	.024	.158	.206	.003	.26
Feb. 3	.0	44.5	8.5	36.0	2.75	.016	.136	.290	.003	.18
Mar. 3	.0	43.0	8.0	35.0	2.75	.008	.120	.228	.000	.05
Apr. 1	.0	42.0	9.0	33.0	2.25	.008	.128	.182	.001	.22
May 1	.1	41.0	8.0	33.0	3.00	.030	.158	.230	.001	.07
June 2	.0	48.5	7.5	41.0	2.25	.056	.194	.298	.001	.04
July 2	.1	49.0	7.5	41.5	2.38	.044	.192	.350	.005	.00
Average	.06	45.2	9.3	35.9	2.43	.060	.169	.289	.0018	.10

CHEMICAL EXAMINATION, 1890-91.

Figures indicate milligrams per liter, or parts per million. Water filtered through paper, except as noted.

Date.	Color.	Residue on Evaporation. Total at 100° C.	Residue on Evaporation. Loss on Ignition.	Residue on Evaporation. Fixed.	Chlorine.	Nitrogen. Of Albuminoid Ammonia.	Nitrogen. Of Free Ammonia not filtered.	Nitrogen. Of Album'd Ammonia not filtered.	Nitrogen. Of Nitrites.	Nitrogen. Of Nitrates.	Hardness as $CaCO_3$.	Oxygen consum'd from Permanganate ½ h. at 100° C.
Aug. 1	0.00	46.5	10.0	36.5	2.25	0.182	0.020	0.258	0.000	0.02	19.	2.25
Sept. 1	.05	51.5	10.0	41.5	2.33	.206	.030	.572	.000	.02	19.	2.40
Oct. 1	.30	45.5	11.5	34.0	2.33	.214	.026	.346	.001	.07	23.	4.95
Nov. 1	.10	47.5	11.0	36.5	2.48	.180	.024	.406	.003	.03	22.	3.40
Dec. 2	.05	46.0	7.0	39.0	2.45	.206	.018	.228	.001	.05	25.	4.15
Jan. 2	.00	23.0	7.0	16.0	1.03	.078	.066	.092	.000	.06	8.	2.00
Feb. 2	.05	22.5	5.0	17.5	2.13	.154	.016	.182	.000	.03	8.	2.40
Mar. 2	.00	41.5	8.5	33.0	2.25	.160	.044	.190	.003	.07	17.	3.30
Apr. 1	.00	29.5	5.5	24.0	2.25	.116	.024	.130	.004	.16	25.	2.65
May 1	.05	33.0	5.5	27.5	2.45	.162	.028	.206	.000	.02	18.	2.30
June 1	.05	35.0	6.5	28.5	1.75	.164	.032	.304	.000	.02	20.	2.10
Average	.06	38.3	8.0	30.3	2.15	.166	.030	.265	.0010	.05	19.	2.90

Remarks.—The odor was usually slight, but in several samples it was recorded as disagreeable, stale, swampy. Sometimes nearly clear, but frequently turbid from suspended organisms. The sediment was usually scanty, sometimes moderate or considerable, yellowish flocculent.

MICROSCOPICAL EXAMINATION, 1889-90, 1890-91.

Figures show average organisms per cubic centimeter of water, * means present in small number. First year in Roman type, second year in full face type.

	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July
DIATOMACEÆ—												
Asterionella	----	----	26	20	----	10	12	140	150	----	20	2
	6	----	----	----	----	----	----	**13**	----	----	**19**	----
Synedra	----	----	----	----	----	----	----	----	----	----	*	----
Navicula	----	----	----	*	----	----	----	----	----	----	----	----
Surirella	----	----	----	----	----	----	----	----	----	*	----	----
Tabellaria	----	----	----	----	----	----	*	----	*	----	----	----
	----	----	----	----	**19**	----	----	**5**	----	----	----	----
Nitzschia, Nitzschiella	----	240	100	1300	100	20	*	*	150	300	----	----
	32	**33**	**36**	**49**	**46**	----	----	----	----	**62**	**81**	----
Fragillaria	----	----	----	*	----	----	----	----	----	----	----	----
Orthosira	----	----	----	----	----	10	----	*	----	840	----	----
	22	8	**16**	----	**11**	----	----	----	**14**	**29**	**55**	----
Undetermined	----	----	----	----	----	----	----	----	----	10	----	----
CYANOPHYCEÆ—												
Clathrocystis	----	45	32	2	----	----	----	----	----	----	1	3.5
	16	**34**	**19**	**9**	**0.4**	----	----	----	----	**5**	**14**	----
Merismopedia	----	8	----	----	----	----	----	----	----	----	----	----
Anabæna	----	120	5	----	----	----	----	----	----	----	----	3
	210	**226**	**62**	**10**	8	----	----	----	----	**36**	**45**	----
Glœocapsa	**69**	----	----	----	----	*	----	----	----	----	----	----
DESMIDACEÆ—												
Staurastrum	1	----	4	----	----	----	----	----	----	----	4	120
	----	8	**7**	----	----	----	----	----	----	----	----	----
Closterium	----	----	----	----	----	----	----	----	----	----	----	----
Cosmarium	*	**10**	*	----	----	----	----	----	----	----	----	----
OTHER ALGÆ—												
Spirogyra	----	----	----	----	----	----	----	----	----	*	----	----
Protococcus	30	*	*	----	----	----	----	----	*	*	*	----
	94	**258**	**14**	**3**	**18**	**4**	**7**	**9**	**15**	**18**	**27**	----
Scenedesmus	13	50	10	----	----	----	----	----	*	250	10	40
	92	8	**6**	----	**2**	----	----	----	----	8	**18**	----
Pediastrum	1	4	7	2	----	----	----	----	----	1	6	250
	----	----	**2**	----	----	----	----	----	----	**2**	----	----
Conferva	8	60	60	8	6	----	----	----	----	----	----	----
Polyedrium	----	----	----	----	----	7	2	----	----	----	----	----
	3	**3**	*	----	----	----	----	**10**	----	----	----	----
FUNGI—												
Undetermined	----	100	40	----	----	----	----	----	----	----	----	----
ANIMALS—												
Sponge spicules	----	----	----	**2**	----	----	----	----	----	----	----	----
Actinophrys	----	----	5	30	2	----	----	----	----	----	----	----
Amœba	----	----	----	*	4	----	----	----	----	----	----	----
	----	----	----	----	----	----	----	----	----	*	----	----
Difflugia	----	----	----	----	8	0.6	*	*	5	----	----	----
	----	----	----	----	----	----	----	**3**	*	----	----	----
Anuræa	----	----	*	*	3	*	3	*	2	2	*	*
	*	**3**	**7**	*	*	----	----	----	*	----	2	----
Ceratium	----	----	----	----	----	----	----	----	----	----	----	*
	----	*	----	----	----	----	----	----	----	----	----	----
Trachelomonas	*	**3**	**2**	**2**	**3**	----	----	----	----	----	**4**	----
Peridineum	----	----	----	----	10	----	----	2	9	10	----	----
	*	*	----	----	**2**	**3**	**59**	**27**	**2**	----	----	----

	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July
Polyarthra	----	----	----	----	----	----	----	----	----	0.5	----	----
	----	----	*	----	----	----	----	----	----	----	2	----
Asplanchna	----	----	*	----	----	----	----	----	----	----	----	----
	----	----	*	----	----	----	----	----	----	----	----	----
Vorticella	----	----	----	----	*	----	----	----	----	----	----	----
Monocerca	----	----	----	----	----	----	----	----	----	----	----	----
Dinobryon	----	----	*	180	550	950	2250	360	250	----	----	----
	----	----	----	----	5	----	----	24	22	----	----	----
Eosphora	----	----	----	----	----	----	----	----	----	----	----	*
Uroglena	----	8	7	----	----	----	----	----	----	----	----	----
Synura	----	2	----	----	----	----	----	----	----	----	----	----
	4	*	----	6	3	----	----	----	----	----	----	----
Euglena	----	----	3	----	----	----	----	----	----	*	----	----
Chlamydomonas	2	----	----	----	----	----	----	----	----	----	----	----
Undetermined	----	----	----	----	----	----	----	----	----	1	----	----
Cyclops	----	----	0.3	----	----	----	----	----	----	*	5.2	*
	*	----	*	----	----	----	----	----	----	*	*	----

SUMMARY.

	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July
Diatomaceæ	*	240	126	1320	100	40	12	140	300	1150	20	2
	58	41	52	49	73	----	----	18	14	91	155	----
Cyanophyceæ	----	173	37	2	----	----	----	----	----	----	1	6
	295	260	81	25	8	*	----	----	----	41	59	----
Desmidaceæ	1	18	4	----	----	----	----	----	----	----	4	120
Protococcaceæ	44	62	17	2	----	----	----	----	*	251	16	290
	189	284	24	3	20	4	7	9	15	28	45	----
Conferva	8	60	60	8	6	----	----	----	----	----	----	----
Rhizopoda	----	----	5	30	14	0.6	*	*	5	*	----	----
	----	----	----	----	----	----	----	3	*	*	----	----
Rotifera	----	----	*	*	3	*	3	*	2	3	*	*
	----	----	11	*	*	----	----	----	*	----	5	----
Infusoria	2	2	3	180	560	950	2250	362	260	11	----	*
	*	6	9	8	13	3	59	51	13	----	4	----
Crustacea	----	----	0.3	----	----	----	----	----	----	----	5.2	*
	*	----	*	----	----	----	----	----	----	*	*	----

Remarks for the Year ending July, 1890.

August—Analyses made from tap-water, and hence incomplete.

September—Fragments of conferva, short, partly dead. Considerable yellowish debris.

October—Clathrocystis breaking down.

November—Moderate quantity of debris.

February—Moderate quantity of debris.

March—Considerable debris and fragments.

April—Considerable debris and fragments.

May—Considerable debris and fragments.

June—Considerable fragments.

July—Small amount debris. Clathrocystis in small masses. Anabæna in long filaments.

BACTERIOLOGICAL EXAMINATION, 1889-90.

	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June	July.
Average No. bacteria per c. c.	116	150	2803	836	343	187	438	467	164	231	1067	1113
Temperature of water at time of collection ° F.	....	68	59	50	38	36	32	36	40	....	....	72
Temperature air monthly mean ° F.*	64.4	61.8	47.2	42.5	36.	33.7	34.2	32.7	46.9	57.1	65.9	69.
Precipitation during month in inches.*	5.12	4.72	5.47	7.03	2.79	2.84	3.28	7.45	2.84	5.51	2.16	4.16

* From Middletown records, kept by Mr. H. D. A. Ward.

BACTERIOLOGICAL EXAMINATION, 1890-91.

	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June
Average No. bacteria per c c.	24	688	3203	323	69	209	206	172	149	147	424
Temperature water at time of collection ° F.	80	70	61	44	35	36	34	38	46	58	71
Temperature air monthly mean ° F.*	67.8	61.1	49.1	39.5	24.7	29.0	31.5	34.3	48.9	56.4	66.0
Precipitation during month in inches*	4.66	5.97	7.52	.75	4.46	9.24	6.09	5.96	3.90	1.62	2.70

* From Middletown records, kept by Mr. H. D. A. Ward.

REMARKS.—The forms of bacteria most abundant and constant are a white solid, fluorescent solid, pink solid, and a white liquefying. There were present also at various times green and yellow liquefying, a bluish white solid, and a purple or violet form.

(5). NEW HAVEN.

Population, 81,298 (city). Daily consumption of water, 9,000,000 gallons. The works are owned by a stock company, the New Haven Water Co. The sources of supply are Lake Whitney, Wintergreen Lake, Saltonstall Lake, and the Maltby ponds. A system of reservoirs for a gravity supply is now being constructed along West River in Woodbridge and Bethany.

Lake Whitney.—This reservoir was formed by a dam constructed in 1860–62 across Mill River about two miles from the

center of the city. It has a capacity of 500,000,000 gallons, and is deep along the river channel, but there is a large extent of shallow flowage at the upper end. The banks are mostly loam, and it is surrounded with pastures, cultivated fields and woodland. At the lower end there are several houses. The river flows through an agricultural region somewhat thickly settled, and drains an area of 56 square miles. From the lake, water is raised by both water and steam pumps to a distributing reservoir on Prospect street, from which it is distributed to a large part of the city.

Wintergreen Lake.—This is an artificial reservoir having a capacity of 12,000,000 gallons, and supplied from small streams and springs. The watershed is thickly wooded on the west, rocky and sparsely wooded on the east. The shore is rocky and deep on the east, but for the most part shallow and loamy on the west and at the upper end. There is no house drainage, but the woodland drainage and the muck bottom of the shallow flowage are the most noticeable features of the reservoir.

The Maltby Ponds.—These are three artificial reservoirs having a capacity of 15,000,000, 59,000,000, and 55,000,000 gallons. The watershed is mostly rocky woodland with no house drainage, the shores are largely rocky, and there is much shallow flowage. They constitute but a small portion of the supply of the city and were not examined.

Saltonstall Lake.—This is a natural lake having an area of 400 acres, and situated four miles east of the city. Its capacity is unknown, but "for each foot in depth about 130,000,000 gallons, average yearly quantity 1,270,000,000 gallons." The lake is supplied by springs and small streams from the adjacent watershed of 3½ square miles, which on the eastern side is loamy pasture and woodland, but on the west, it is hilly woodland with a bold rocky shore. It is free from house drainage. The water is pumped by steam from the lower end of the lake into a distributing reservoir.

The water mains are of cast iron, wrought iron and cement pipes; the service pipes are mostly galvanized iron.

Samples for examination were collected on the tenth of the month by some person connected with the laboratory, from the following sources: at Lake Whitney, for two years, just above the dam; at Wintergreen Lake, for one year, off the rocks at the south end; at Saltonstall Lake, for one year, from a tap in the pumping station.

ANALYSES OF LAKE WHITNEY WATER.

Samples taken just above the Dam.

CHEMICAL EXAMINATION, 1889-90.

Figures indicate milligrams per liter, or parts per million. Water filtered through paper.

Date.	Color.	Residue on Evaporation.			Chlorine.	Nitrogen.				
		Total at 100° C.	Loss on Ignition.	Fixed.		Of Free Ammonia.	Of Albuminoid Ammonia.	Organic.	Of Nitrites.	Of Nitrates.
Aug. 12	0.1	----	----	----	2.25	0.022	0.150	0.238	0.000	0.02
Sept. 10	.1	72.0	9.0	63.0	3.00	.030	.132	.290	.000	.02
Oct. 10	.2	65.0	8.0	57.0	3.00	.016	.164	.344	.006	.10
Nov. 11	.0	64.5	8.5	56.0	3.00	.022	.120	.218	.001	.12
Dec. 10	.0	59.0	9.0	50.0	2.75	.010	.070	.200	.002	.24
Jan. 13	.0	64.0	7.5	56.5	3.00	.020	.076	.246	.006	.20
Feb. 11	.0	53.5	4.0	49.4	3.25	.038	.098	.218	.004	.20
Mar. 10	.0	57.5	6.5	51.0	2.75	.020	.088	.226	.002	.24
Apr. 11	.0	51.5	5.0	46.5	2.50	.006	.110	.204	.001	.22
May 11	.1	62.0	11.0	51.0	2.25	.026	.140	.224	.003	.16
June 11	.1	64.5	5.0	59.5	2.25	.038	.136	.206	.000	.06
July 11	.0	65.0	7.0	58.0	2.75	.002	.118	.232	.003	.04
Average	.05	61.6	7.3	54.3	2.73	.021	.125	.237	.0023	.14

CHEMICAL EXAMINATION, 1890-91.

Figures indicate milligrams per liter, or parts per million. Water filtered through paper, except as noted.

Date.	Color.	Residue on Evaporation.			Chlorine.	Nitrogen.					Hardness as $CaCO_3$.	Oxygen consum'd from Permanganate ½ h. at 100° C.
		Total at 100° C.	Loss on Ignition.	Fixed.		Of Albuminoid Ammonia.	Of Free Ammonia not filtered.	Of Album'd Ammonia not filtered.	Of Nitrites.	Of Nitrates.		
Aug. 11	0.20	64.0	4.5	59.5	2.75	0.176	0.028	0.244	0.000	0.01	34.	1.90
Sept. 11	.05	67.5	6.0	61.5	3.30	.174	.004	.186	.000	.02	36.	2.90
Oct. 10	.20	68.0	6.5	61.5	3.13	.142	.026	.140	.006	.10	37.	2.65
Nov. 10	.50	61.0	8.0	53.0	2.73	.086	.028	.096	.002	.03	36.	2.70
Dec. 10	.05	69.5	2.0	67.5	3.00	.100	.006	.092	.001	.20	40.	2.05
Jan. 10	.05	53.0	5.5	47.5	2 58	.102	.036	.100	.002	.30	33.	3.05
Feb. 10	.05	32.0	4.5	27.5	1.63	.090	.022	.112	.001	.16	16.	2.60
Mar. 10	.15	42.5	4.0	38.5	2.05	.110	.034	.116	.002	.12	25.	2.75
Apr. 10	.10	43.5	4.0	39.5	3.13	.124	.016	.124	.003	.10	29.	2.20
May 11	.05	64.0	4.5	59.5	3.08	.118	.034	.144	.002	.02	36.	2.15
June 9	.05	62.5	8.0	54.5	2.63	.130	.018	.154	.002	.06	42.	2.95
Average	.13	57.0	5.2	51.8	2.73	.123	.023	.137	.0018	.10	33.	2.54

REMARKS.—The odor was usually slight but sometimes distinct or marked, swampy, musty, marshy, disagreeable, and fish-like (in May and June, 1891). It was nearly clear or slightly turbid from fine suspended matter. The sediment was very scanty except in March, 1891, when it was moderate, fine and clay-like.

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MICROSCOPICAL EXAMINATION, 1889-90, 1890-91.

Figures show average organisms per cubic centimeter of water. * means present in small number. First year in Roman type, second year in full face type.

	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July
DIATOMACEÆ—												
Asterionella				1				*		3	*	
											34	
Synedra	0.5	4	*	1		0.5	*	*	2	1	*	
			*	**5**				*		*		
Tabellaria						2		10	1	*	*	
										15		
Pinnularia		1		0.2								
Stauroneis				0.8								*
Navicula				0.2								
		2	*					*				
Cymbella				0.4								
Nitzschia				2				10	4	3	*	*
								11				
Gomphonema										*		
								*				
Surirella							*			*	*	
Fragillaria							*					
Orthosira							*					50
	24	**4**	**18**	**6**	**3**			**7**		**10**		
Melosira		*		5								
CYANOPHYCEÆ—												
Clathrocystis												**1**
Anabæna	0.2											
	2	**3**										
Undetermined		20										
Merismopedia	*											
DESMIDACEÆ—												
Staurastrum					*				1			8
		9	*									
Cosmarium		*										
Closterium									*			*
	*											
Xanthidium	*											
OTHER ALGÆ—												
Protococcus	20	20			*	20				*	*	80
	38	**33**	**11**	**3**	**14**		*	8	**13**	**7**	**15**	
Scenedesmus										1		
		6		*						**5**	**6**	
Rhaphidium		**13**										
Pediastrum												**1**
	*											
Spirogyra										*		
	*											
Conferva				*								
ANIMALS—												
Actinophrys	*					0.5					0.5	
				*								
Difflugia								*			**5**	*
			*	*							**22**	
Anuræa										*	2	*
	*	**3**									**6**	
Trachelomonas	*	**4**	**2**							**4**	**7**	
Peridineum										*		54
				*	*				**5**	**3**		

	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July
Polyarthra	----	----	----	----	----	----	----	----	----	----	0.8	*
	*	----	----	----	----	----	----	----	----	----	4	----
Asplanchna	----	----	----	----	----	----	----	----	----	----	0.5	----
Floscularia	----	----	----	----	----	----	----	----	----	----	----	*
Dinobryon	----	---	----	----		*	----	----	----	----	----	*
	----	----	----	----	----	----	----	----	4	--	29	----
Euglena	----	2	----	----	----	----	----	*	----	----	1	----
	----	----	----	----	----	----	----	----	*	*	----	----
Phacus	----	----	2	----	----	----	----	----	----	----	----	---
Pandorina	----	----	----	----	----	----	----	----	*	1	----	----
	*	*	----	----	----	----	----	----	----	----	----	----
Eudorina	----	----	----	----	----	----	----	----	----	----	2	5
	----	----	----	----	----	----	----	----	----	----	2	----
Synura	----	----	----	----	----	----	----	----	----	----	----	2
Cyclops	----	----	----	----	----	----	----	----	----	*	----	*

SUMMARY.

	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July
Diatomaceæ	0.5	5	*	12	----	----	*	10	7	7	*	47
	24	6	18	11	3	----	----	18	----	25	34	----
Cyanophyceæ	0.2	20	----	----	----	----	----	----	----	----	----	1
	2	3	----	----	----	----	----	----	----	----	----	----
Desmidaceæ	----	----	----	----	*	----	----	----	1	----	----	8
	*	9	*	---	----	----	----	----	----	----	----	----
Protococcaceæ	20	20	----	----	*	---	----	----	----	1*	*	28
	38	52	11	3	14	----	*	8	13	12	21	----
Conferva	----	----	----	*	----	----	----	----	----	----	----	----
Rhizopoda	----	----	----	----	----	----	----	----	----	----	5	----
	----	----	*	*	----	----	----	----	----	----	22	----
Rotifera	----	----	----	----	----	----	----	----	----	----	2	*
	----	----	----	----	----	----	----	----	----	----	6	----
Infusoria	2	*	*	----	----	----	----	*	*	1	3	61
	*	7	4	*	*	----	*	----	9	7	42	----
Crustacea	----	----	----	----	----	----	----	----	----	*	----	*

Remarks for the Year 1889–90.

August—Large quantities of flocculent yellowish debris.
September—Considerable quantities yellowish debris.
October—Moderate quantities debris.
November—Small amount of debris.
December—Moderate quantities yellowish debris, with much debris of higher plants.
January—Fragments of higher plants.
February—Fragments of higher plants.
March—Fragments of higher plants.
April—Moderate amount of debris.
May—Considerable amount of yellowish debris.
June—Large quantities of yellowish debris.
July—Small amount of debris.

BACTERIOLOGICAL EXAMINATION, 1889-90.

	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July
Average No. bacteria per c. c.	77	750	100	134	1309	283	707	343	243	323	287	88
Temperature water at time of collection ° F.	70	70	57	47	45	40	37	38	47	60	73	76
Temperature air monthly mean 10th–10th), ° F.*	70.	67.1	57.7	47.5	39.2	39.5	34.4	32.3	39.5	50.6	60.3	67.5
Temperature air for month, monthly mean ° F.*	68.5	63.	48.8	44.2	38.8	35.4	35.5	34.2	47.	56.8	65.9	69.4
Precipitation during month (10th to 10th), in inches.*	15.59	2.63	6.64	4.58	6.51	1.71	3.85	3.26	7.52	2.73	3.93	2.76
Total precipitati'n during month in inches.*	4.38	4.98	3.96	7.78	2.62	3.07	3.19	6.60	2.89	4.24	3.12	6.59

* From records of U. S. Signal Station, New Haven.

BACTERIOLOGICAL EXAMINATION, 1890-91.

	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
Average No. bacteria per c. c.	55	223	282	71	103	246	171	385	117	375	357
Temperature water at time of collection ° F.	78	72	61	45	34	32	32	44	46	62	70
Temperature air monthly mean (10th–10th), ° F.*	72.5	66.8	59.8	50.	34.9	26.2	32.6	31.7	38.4	54.1	57.2
Temperature air for month monthly mean ° F.*	69.1	62.8	51.3	41.7	26.6	30.8	32.3	35.1	48.6	56.	66.2
Precipitation during month (10th–10th), in inches*	5.67	1.91	6.74	5.73	1.44	4.05	7.54	5.17	2.15	2 15	2.21
Total precipitation during month in inches*	2.67	5.38	7.63	.67	2.90	6.67	5.88	3.68	2.35	1.92	1.90

* From records of U. S. Signal Station, New Haven.

REMARKS.—The more abundant and frequent forms of bacteria in Lake Whitney were a white solid, white liquefying and green liquefying, pink solid, irregular white solid, yellow solid, fluorescent solid, and a violet or purple form were present at times in the plate cultures.

ANALYSES OF LAKE WINTERGREEN WATER.

Samples taken from the Lake.

CHEMICAL EXAMINATION, 1889-90.

Figures indicate milligrams per liter, or parts per million. Water filtered through paper.

Date.	Color.	Residue on Evaporation.			Chlorine.	Nitrogen.				
		Total at 100° C.	Loss on Ignition.	Fixed.		Of Free Ammonia.	Of Albuminoid Ammonia.	Organic.	Of Nitrites.	Of Nitrates.
Aug. 12	0.4	42.5	16.5	26.0	2.00	0.040	0.172	0.280	0.000	0.01
Sept. 10	.3	38.5	15.5	23.0	2.00	.022	.116	.298	.001	.01
Oct. 10	.4	40.0	12.0	28.0	2.75	.016	.200	.364	.000	.02
Nov. 11	.1	38.5	11.5	27.0	3.25	.026	.174	.254	.003	.02
Dec. 10	.3	34.0	10.5	23.5	2.63	.014	.144	.236	.000	.02
Jan. 13	.2	34.0	11.5	22.5	3.00	.024	.166	.232	.003	.08
Feb. 11	.1	33.5	9.5	24.0	3.00	.034	.210	.376	.005	.08
Mar. 10	.1	36.0	7.5	28.5	3.25	.040	.190	.492	.000	.08
Apr. 11	.0	30.5	9.0	21.5	2.50	.008	.102	.192	.000	.06
May 11	.1	33.0	11.0	22.0	2.50	.014	.120	.196	.001	.07
June 11	.2	40.5	10.0	30.5	2.75	.068	.318	.606	.000	.02
July 11	.2	34.5	12.0	22.5	2.75	.008	.180	.246	.000	.04
Average	.2	36.3	11.4	24.9	2.70	.026	.174	.314	.0011	.04

REMARKS.—The odor was usually described as slight, woody, as of old wood or mould. Usually clear. Sediment usually very scanty or scanty, occasionally considerable, light brown and flocculent.

MICROSCOPICAL EXAMINATION, 1889-90.

Figures show average organisms per cubic centimeter of water, * means present in small number.

	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July
DIATOMACEÆ—												
Asterionella				*	*	*	*	20	*	40		
Synedra	0.5					1		*	*			1
Tabellaria			5	*			*			10		
Cymbella				*								
Navicula				*								
Gomphonema							*					
Surirella								*				
Nitzschia	7		20			1						
Orthosira	15	80	10		*	*		14	60			
CYANOPHYCEÆ—												
Undetermined		50										
DESMIDACEÆ—												
Staurastrum	2	4	*		*	*		*	*			8
Cosmarium		*										
Sphærozosma		*	*									
Closterium		*	*	60	*	*	10	*	*	*		
Micrasterias			*									

	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July
OTHER ALGÆ—												
Protococcus	10	20	40	----	----	----	----	40	----	----	----	40
Cœlastrum	----	----	*	----	----	----	----	----	----	----	----	----
Pediastrium	----	*	*	----	----	*	----	----	----	*	----	1
Conferva	----	----	*	1	----	----	----	----	----	----	----	----
FUNGI—												
Leptothrix	----	----	----	----	----	----	----	----	----	*	----	----
ANIMALS—												
Actinophrys	----	----	1	----	----	----	----	----	----	----	----	----
Difflugia	----	----	----	----	----	----	----	----	----	----	----	----
Anuræa	----	----	*	----	----	----	----	----	----	----	----	*
Peridineum	----	----	----	----	----	----	*	----	----	2	----	55
Polyarthra	----	----	----	----	----	----	----	----	3	----	----	*
Leposinclus	----	----	10	----	----	----	----	----	----	----	----	----
Condylostoma	----	----	*	----	----	----	----	----	----	----	----	----
Floscularia	----	----	----	----	----	----	----	----	----	----	----	*
Dinobryon	----	----	----	----	*	----	*	----	*	50	----	*
Euglena	----	*	----	----	----	----	----	----	----	----	----	----
Cyclops	----	----	----	----	----	----	----	----	*	*	*	*

SUMMARY.

	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July
Diatomaceæ	23	80	35	*	*	*	*	34	60	50	*	1
Cyanophyceæ	----	50	----	----	----	----	----	----	----	----	----	----
Desmidaceæ	2	4	*	60	*	20	10	*	*	*	*	8
Protococcaceæ	10	20	40	1	----	*	----	40	----	*	----	41
Conferva	----	----	*	1	----	----	----	----	----	----	----	----
Rhizopoda	----	----	1	----	----	----	----	----	----	----	----	----
Rotifera	----	----	*	----	----	----	----	----	3	----	----	*
Infusoria	----	*	10	----	*	----	*	----	----	50	----	55
Crustacea	----	----	----	----	----	----	----	----	*	*	*	*

REMARKS FOR THE YEARS 1889 AND 1890.

August—Large quantities of yellowish debris.
September—Large quantities of flocculent dead material, clogging filter.
October—Moderate quantities of yellowish debris.
November—Small quantities of yellowish debris.
December—Considerable quantities debris of higher plants.
January—Considerable quantities debris of higher plants.
February—Considerable quantities debris of higher plants.
March—Moderate quantities of debris of higher plants.
April—Considerable debris.
May—Considerable debris.
June—Very large quantities of debris, filtering very slowly.
August and September analyses were made from tap-water taken at Springside Farm.

BACTERIOLOGICAL EXAMINATION, 1889-90.

	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June	July
Average No. bacteria per c. c.	68	922	280	92	852	157	961	184	123	328	185	45
Temperature water at time of collection ° F.	69	70	58	48	44	38	36	35	46	59	73	74
Temperature air monthly mean (10th–10th), ° F.*	70	67.1	57.7	47.5	39.2	39.5	34.4	32.3	39.5	50.6	60.3	67.5
Temperature air during month monthly mean ° F.*	68.5	63.	48.8	44.2	38.8	35.4	35.5	34.2	47.	56.8	65.9	69.4
Precipitation during month (10th to 10th), in inches *	15.59	2.63	6.64	4.58	6.51	1.71	3.85	3.26	7.52	2.73	3.93	2.76
Total precipitat'n during month in inches *	4.38	4.98	3.96	7.78	2.62	3.07	3.19	6.60	2.89	4.24	3.12	6.59

* From records of U. S. Signal Station, New Haven.

REMARKS.—In Lake Wintergreen there was found white liquefying, white solid, fluorescent solid, green liquefying, and pink solid colonies.

ANALYSES OF LAKE SALTONSTALL WATER.

Samples taken from faucet at pumping station.

CHEMICAL EXAMINATION, 1890-91.

Figures indicate milligrams per liter, or parts per million. Water filtered through paper, except as noted.

		Residue on Evaporation.				Nitrogen.						
Date.	Color.	Total at 100° C.	Loss on Ignition.	Fixed.	Chlorine.	Of Albuminoid Ammonia.	Of Free Ammonia not filtered.	Of Album'd Ammonia not filtered.	Of Nitrites.	Of Nitrates.	Hardness as $CaCO_3$.	Oxygen consum'd from Permanganate ½ h. at 100° C.
Aug. 11	0.10	49.0	8.0	41.0	3.58	0.134	0.016	0.148	0.000	0.01	24.	2.15
Sept. 10	.05	53.5	7.5	46.0	3.63	.156	.008	.156	.000	.02	25.	2.99
Oct. 10	.20	57.5	12.5	45.0	4.13	.178	.014	.196	.002	.04	25.	5.65
Nov. 10	.01	56.5	12.0	44.5	3.98	.154	.012	.156	.002	.04	25.	4.05
Dec. 10	.05	53.0	8.5	44.5	3.70	.128	.006	.136	.000	.02	26.	3.55
Jan. 10	.05	52.0	8.0	44.0	3.60	.144	.008	.142	.000	.03	25.	4.20
Feb. 10	.20	47.0	7.5	39.5	3.53	.144	.020	.160	.000	.03	17.	5.30
Mar. 10	.10	47.5	5.5	42.0	3.50	.108	.016	.112	.001	.02	26.	2.95
Apr. 10	.15	43.5	6.5	37.0	3.80	.144	.010	.140	.002	.02	26.	2.60
May 11	.00	50.5	10.0	40.5	----	.116	.016	.130	.000	.00	25.	2.45
June 9	.00	43.5	8.0	35.5	3.68	.120	.008	.146	.000	.00	27.	3.05
Average	.08	50.2	8.5	41.7	3.70	.139	.012	.147	.0006	.02	25.	3.54

REMARKS.—The odor was slight and described as pond-like, swampy, marshy, woody. Usually clear, but was turbid in January, February and March. The sediment always described as very scanty.

MICROSCOPICAL EXAMINATION, 1890-91.

Figures show average organisms per cubic centimeter of water, * means present in small number.

	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July
DIATOMACEÆ—												
Tabellaria	9	17	5									
Synedra	*		8	5	*	4		7				
Gomphonema	*											
Navicula			3				*	3				
Asterionella				13				10		31		
Orthosira				16	13		6	12	4	28		
Nitzschia											13	
CYANOPHYCEÆ—												
Anabæna	14											
Merismopedia			*									
DESMIDIACEÆ—												
Staurastrum	2											
PROTOCOCCACEÆ—												
Protococcus	9	14	11	10	5	9	5	12	16	16	17	
Rhaphidium	8		2				2					
Scenedesmus	6										4	
CONFERVACEÆ—												
Conferva	15			80	4		0.2	0.2				
Oscillaria	5											
RHIZOPODA—												
Difflugia				2						3		
INFUSORIA—												
Ceratium	*											
Peridinium	4	2	3							4	5	
Trachelomonas	5											
Dinobryon	26	3								6	10	
Euglena	3	5										
Pandorina		2										
Phacus		2										
Vorticella			12									
ROTIFERA—												
Anurea	*				*					*	4	
CRUSTACEA—												
Cyclops										*		

SUMMARY.

	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July
Diatomaceæ	9	17	16	34	13	4	6	32	4	59	13	
Cyanophyceæ	14		*									
Desmidaceæ	2											
Protococcaceæ	23	14	13	10	5	9	7	12	16	16	21	
Confervaceæ	15			80	4		0.2	0.2				
Rhizopoda				2						3		
Infusoria	38	14	15							10	15	
Rotifera	*				*					*	4	
Crustacea										*		

BACTERIOLOGICAL EXAMINATION, 1890-91.

	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
Average No. bacteria per c. c.	67	85	200	70	151	442	175	39	125	219	161
Temperature water at time of collection	79	73	64	48	39	40	39	44	45	63	72
Temperature air monthly mean (10th–10th), ° F.*	72.5	66.8	59.8	50.	34.9	26.2	32.6	31.7	38.4	54.1	57.2
Temperature air during month, monthly mean*	69.1	62.8	51.3	41.7	26.6	30.8	32.3	35.1	48.6	56.	66.2
Precipitation during month (10th–10th), in inches*	5.67	1.91	6.74	5.73	1.44	4.05	7.54	5.17	2.15	2.15	2.21
Total precipitation during month in inches*	2.67	5.38	7.63	.67	2.90	6.77	5.88	3.68	2.35	1.92	1.90

* From records of U. S. Signal Station, New Haven.

REMARKS.—In Lake Saltonstall green liquefying, white liquefying, white solid colonies were abundant. There was present from time to time pink solid, bluish white solid, yellow round and irregular solid colonies.

(6). ROCKVILLE.

Population, 7772 (city). Consumption of water not given. The supply comes from Snipsic or Schenipsit Lake, a natural pond greatly enlarged by a masonry dam constructed in 1867 by the Rockville Aqueduct Co. Its area is 524 acres. It is a gravity supply with an ordinary pressure of 75 pounds.

Just above the dam is a narrow portion of the lake with boat-houses, wharf and ice houses but no residences. The west shore is rocky and steep with woodland to the edge. On this side, there are two small inlets, three summer houses, and a picnic ground, which at times accommodates as many as 2,000 people. At the north end, there are rocky shores and woodland with two inlets. On the east side, the shore is sandy with little swamp land. The banks slope gradually to the distant hills, and are occupied mostly by pastures, but by some cultivated fields. There are perhaps a

dozen dwelling houses in sight on this side, which also furnishes two inlets, one of considerable size.

Distributing mains are cast iron. Service pipes are of lead.

Samples for analysis were collected for one year on the 20th of each month from the aqueduct just below the dam, through the courtesy of Mr. Henry Adams.

Analysis of Rockville Water Supply.

Samples taken from the aqueduct, near the dam.

CHEMICAL EXAMINATION, 1890-91.

Figures indicate milligrams per liter, or parts per million. Water filtered through paper, except as noted.

Date.	Color.	Residue on Evaporation. Total at 100° C.	Residue on Evaporation. Loss on Ignition.	Residue on Evaporation. Fixed.	Chlorine.	Nitrogen. Of Albuminoid Ammonia.	Nitrogen. Of Free Ammonia not filtered.	Nitrogen. Of Album'd Ammonia not filtered.	Nitrogen. Of Nitrites.	Nitrogen. Of Nitrates.	Hardness as $Ca\,Co_3$.	Oxygen consum'd from Permanganate ½ h. at 100° C.
Aug. 20	0.10	31.5	9.0	22.5	1.65	0.124	0.014	0.148	0.000	0.01	6.	2.70
Sept. 20	.20	34.5	12.0	22.5	1.53	.156	.022	.190	.000	.03	6.	3.60
Oct. 20	.20	32.5	10.5	22.0	1.50	.144	.024	.150	.001	.03	8.	4.55
Nov. 20	.20	35.0	14.0	21.0	1.80	.148	.026	.162	.006	.06	12.	5.45
Dec. 20	.20	40.0	12.0	28.0	2.58	.380	.060	.404	.000	.04	9.	6.60
Jan. 20	.10	31.0	7.0	24.0	1.80	.214	.042	.238	.000	.05	9.	4.20
Feb. 20	.30	32.0	8.0	24.0	1.13	.156	.032	.210	.000	.03	4.	4.40
Mar. 20	.10	26.5	8.5	18.0	1.30	.136	.020	.166	.000	.02	4.	3.55
Apr. 20	.15	27.5	11.0	16.5	1.75	.142	.018	.150	.001	.06	5.	3.00
May 20	.10	28.5	10.0	18.5	1.50	.140	.014	.158	.000	.04	5.	3.40
June 20	.05	25.5	6.5	19.0	1.75	.144	.022	.158	.001	.00	6.	5.10
Average	.15	31.3	9.9	21.4	1.66	.171	.027	.194	.0008	.03	7.	4.23

Remarks.—The odor was described as none, slight or distinct, woody, swampy, stale. Nearly clear or slightly turbid. The sediment was very scanty, scanty or moderate, yellow and flocculent.

MICROSCOPICAL EXAMINATION, 1890-91.

Figures show average organisms per cubic centimeter of water, * means present in small number.

	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July
Diatomaceæ—												
Asterionella	73	42	13						17			
Orthosira	17	30	50	7			2		55			
Synedra	*	2										
Tabellaria	8					2			14	68		
Melosira									7	28	9	
Cyanophyceæ—												
Anabæna	15	64	5									
Merismopedia		*	4									

	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July
DESMIDACEÆ—												
Cosmarium	*	----	*	----	----	----	----	----	----	----	----	----
Staurastrum	3	3	3	----	----	----	----	----	----	----	----	----
PROTOCOCCACEÆ—												
Protococcus	7	29	13	17	4	17	13	30	13	21	23	----
Polyedrum	*	----	----	----	----	----	----	----	----	----	----	----
Scenedesmus	----	4	6	21	----	----	----	----	----	8	8	----
Rhaphidium	----	----	----	7	----	3	----	----	----	----	----	----
Pediastrum	----	----	----	6	----	----	----	----	----	----	----	----
RHIZOPODA—												
Actinophrys	2	----	----	----	----	----	----	----	----	----	----	----
Difflugia	----	----	*	----	----	----	----	----	----	----	----	----
INFUSORIA—												
Trachelomonas	2	4	*	3	----	----	----	----	----	4	5	----
Euglena	----	*	----	----	----	----	----	----	----	----	----	----
Peridineum	----	2	----	----	----	2	7	4	----	----	5	----
Phacus	----	2	*	----	----	----	----	----	----	----	----	----
Dinobryon	----	----	----	8	----	----	----	18	----	----	----	----
Pandorina	----	----	----	----	----	----	----	----	----	3	----	----
ROTIFERA—												
Anuræa	----	----	----	----	----	----	----	----	*	----	----	----
CRUSTACEA—												
Cyclops	----	----	*	----	----	----	----	----	----	0.5	----	----

SUMMARY.

	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July
Diatomaceæ	98	74	63	7	----	2	2	----	93	96	9	----
Cyanophyceæ	15	64	9	----	----	----	----	----	----	----	----	----
Desmidaceæ	3	3	3	----	----	----	----	----	----	----	----	----
Protococcaceæ	7	33	19	51	4	20	13	30	13	29	31	----
Confervaceæ	----	----	----	----	----	----	----	----	----	----	----	----
Rhizopoda	2	----	*	----	----	----	----	----	----	----	----	----
Infusoria	2	8	*	11	----	2	7	22	----	7	10	----
Rotifera	----	----	----	----	----	----	----	----	----	*	----	----
Crustacea	----	----	----	*	----	----	----	----	----	----	----	*

BACTERIOLOGICAL EXAMINATION, 1890-91.

	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June
Average No. bacteria per c. c.	68	788	399	76	554	47	101	218	162	201	697
Temperature water at time of collection ° F.	76	68	52	46	30	32	32	32	52	54	70

REMARKS.—A rapidly liquefying white was the most frequently seen form of bacteria. a green liquefying form was common.

White solid, pink solid and yellow solid colonies were occasionally present.

It was not possible to obtain data of the rainfall and temperature.

(7). WILLIMANTIC.

Population, 8,648 (borough). Average daily consumption of water, 350,000 gallons. The works were constructed in 1885–86 by the borough. There is a distributing reservoir of 5,000,000 gallons, into which water is pumped by steam from the Natchaug River.

At the pumping station, there is a masonry dam of an average height of 14 feet above the river bed, over which the water usually flows.

The river flows through a rough country consisting largely of woodland and pastures; it is but sparsely inhabited.

The distributing mains are cast iron. The service pipes are lead and iron.

The samples for analysis were furnished for two years, on the 10th of each month, by the courtesy of Supt. H. S. Moulton, and were collected from a tap at the pumping station.

Analyses of Willimantic Water Supply.

Samples taken from tap at pumping station.

CHEMICAL EXAMINATION, 1889-90.

Figures indicate milligrams per liter, or parts per million. Water filtered through paper.

Date.	Color.	Residue on Evaporation.			Chlorine.	Nitrogen.				
		Total at 100° C.	Loss on Ignition.	Fixed.		Of Free Ammonia.	Of Albuminoid Ammonia.	Organic.	Of Nitrites.	Of Nitrates.
Aug. 12	0.6	42.5	16.5	26.0	1.75	0.036	0.150	0.304	0.001	0.02
Sept. 10	.3	50.5	12.0	38.5	2.25	.024	.100	.236	.000	.03
Oct. 10	1.0	51.0	15.5	35.5	2.50	.014	.178	.326	.000	.03
Nov. 11	.3	47.5	15.5	32.0	2.25	.022	.120	.208	.000	.04
Dec. 10	.3	36.0	12.5	23.5	1.75	.008	.090	.172	.001	.10
Jan. 11	.1	35.0	8.0	27.0	1.75	.010	.100	.146	.003	.09
Feb. 11	.1	32.0	7.0	25.0	2.13	.014	.094	.222	.004	.12
Mar. 10	.1	39.5	6.0	33.5	1.75	.024	.096	.242	.001	.12
Apr. 10	.1	30.5	9.0	21.5	1.50	.008	.104	.152	.000	.12
May 10	.3	35.0	11.5	23.5	1.63	.018	.128	.192	.000	.08
June 11	.7	49.5	13.0	36.5	1.37	.038	.174	.226	.000	.04
July 10	.3	40.5	9.0	31.5	1.75	.004	.118	.192	.001	.04
Average	.4	40.8	11.3	29.5	1.87	.018	.121	.218	.0009	.07

CHEMICAL EXAMINATION, 1890-91.

Figures indicate milligrams per liter, or parts per million. Water filtered through paper, except as noted.

Date.	Color.	Residue on Evaporation. Total at 100° C.	Loss on Ignition.	Fixed.	Chlorine.	Nitrogen. Of Albuminoid Ammonia.	Of Free Ammonia not filtered.	Of Album'd Ammonia not filtered.	Of Nitrites.	Of Nitrates.	Hardness as $CaCO_3$.	Oxygen consum'd from Permanganate ½ h. at 100° C.
Aug. 11..	0.70	44.0	12.0	32.0	2.05	0.168	0.052	0.192	0.001	0.03	15.	3.40
Sept. 11..	.70	50.0	17.5	32.5	2.03	.266	.054	.240	.000	.06	13.	10.20
Oct. 10—	.60	45.0	14.0	31.0	2.33	.114	.048	.132	.002	.08	13.	6.65
Nov. 10..	.20	44.5	11.5	33.0	1.83	.094	.018	.100	.002	.06	13.	3.70
Dec. 10..	.20	38.0	6.0	32.0	2.38	.110	.016	.104	.001	.06	11.	5.00
Jan. 10..	.10	32.0	7.0	25.0	1.95	.114	.012	.108	.000	.08	10.	3.75
Feb. 10..	.10	29.5	4.0	25.5	1.50	.076	.012	.082	.000	.08	7.	2.80
Mar. 10..	.20	22.0	4.0	18.0	1.30	.130	.010	.216	.000	.04	5.	3.90
Apr. 10..	.20	25.0	5.0	20.0	1.75	.102	.010	.098	.000	.03	9.	3.10
May 11..	.20	34.0	8.5	25.5	1.65	.112	.012	.116	.000	.06	11.	3.80
June 9..	.40	38.5	10.0	28.5	1.25	.148	.038	.156	.000	.04	13.	3.70
Average ..	.33	36.6	9·0	27.6	1.82	.130	.026	.140	.0005	.06	11.	4.55

REMARKS.—The odor was usually slight, occasionally distinct, musty, earthy, swampy. Usually nearly clear, but three times (October, March, May, 1891,) turbid or very turbid. The sediment was usually very scanty, but on four dates was considerable or moderate, brown, flocculent.

MICROSCOPICAL EXAMINATION, 1889-90, 1890-91.

Figures show average organisms per cubic centimeter of water, * means present in small number. First year in Roman type, second year in full face type.

	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July
DIATOMACEÆ—												
Asterionella	----	----	----	----	3	----	----	----	*	*	----	----
	18	----	----	----	----	----	----	----	----	----	----	----
Synedra	25	----	----	*	----	----	*	*	*	*	*	----
	----	**3**	----	----	----	----	----	----	----	----	----	----
Nitszchia	----	----	----	----	*	----	----	----	*	*	----	----
	49	**20**	----	----	----	----	----	----	----	----	----	----
Tabellaria	----	----	----	2	*	----	----	----	----	----	----	----
	----	----	----	----	----	----	----	----	----	**21**	----	----
Stauroneis	----	----	----	*	----	----	----	----	----	----	----	----
Pinularia	----	----	----	1	----	----	----	----	----	----	----	----
Himantidium.........	----	----	----	----	----	----	----	*	----	----	----	----
Navicula	1	----	----	----	----	----	----	*	----	----	----	----
	----	----	----	----	----	----	----	*	----	----	----	----
Gomphonema	----	----	----	----	----	----	----	----	*	----	----	----
	----	*	----	----	----	----	----	*	----	----	----	----
Eunotia	----	*	----	----	----	----	----	*	----	----	----	----
Epithemia	----	----	----	----	----	----	----	----	----	*	---	----
Melosira	----	----	*	----	----	----	----	----	----	----	----	----
	----	----	----	**4**	----	----	----	----	----	----	----	----
Orthosira...........	----	----	----	----	----	----	----	----	*	*	----	----
	37	**10**	**5**	----	*	----	----	**12**	**9**	----	**27**	----

	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July
CYANOPHYCEÆ—												
Anabæna	38											
Clathrocystis	*											
DESMIDACEÆ—												
Staurastrum									*			*
	4									9		
Closterium									*	*		
Cosmarium	*											
Hyalotheca										*		
OTHER ALGÆ—												
Polyedrium		*										
Protococcus	30											*
	63	6		5		4	*	4	7	14	18	
Conferva				*								
	40											
Scenedesmus	*	*										
Pediastrum	*											
ANIMALS—												
Difflugia										*		
Anuræa				*								
Peridineum										*		
	4	*							2			
Euglena	0.2											
	3											
Synura												*
	6											
Uroglena	*											
Pandorina	*	*										
Trachelomonas	9											
Dinobryon									6			
Cyclops											*	

SUMMARY.

	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July
Diatomaceæ	1	*	*	3	*		*	*	*	*	*	
	104	23	5	4	*			12	9	21	27	
Cyanophyceæ	38											
Desmidaceæ									*	*		*
		*								9		
Other Algæ	30			*								*
		6		5		4	*	4	7	14	18	
Protozoa	0.2			*						*	*	*
		*							8			

REMARKS FOR THE YEAR ENDING JULY, 1890.

October—Moderate quantity of decaying matter.
November—Numerous rootlets.
December—Fragments of higher plants.
January—Fragments of higher plants.
February—Fragments of higher plants. A few spores.
March—Fragments of higher plants.
April—Small quantity of debris.
May—Small quantity of debris.
June—Moderate quantity of debris.
July—Moderate quantity of debris.

BACTERIOLOGICAL EXAMINATION, 1889-1890.

	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July
Average No. bacteria per c. c.	274	789	907	1782	639	589	998	378	597	726	729	103
Temperature water at time of collection ° F.	68	69	52	47	44	38	34	--	56	58	66	78

BACTERIOLOGICAL EXAMINATION, 1890-1891.

	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June
Average No. bacteria per c. c.	426	146	707	427	213	172	176	171	83	291	154
Temperature water at time of collection ° F.	74	68	56	50	34	33	32	34	46	56	62

REMARKS.—White solid, white liquefying, bluish white solid and fluorescent, colonies the more common forms—yellow and pink forms—noted.

Temperature and rainfall records not obtainable.

(8). NORWICH.

Population, 16,156 (city). Average daily consumption of water, 1,230,000 gallons. The works were constructed by the city in 1866–68. The supply is from an impounding reservoir formed by an earthen dam with masonry heart-wall across a ravine. The area of the reservoir is 66 acres, length 1⅛ miles, average depth 16½ feet, with little shallow flowage, capacity 350,000,000 gallons. The basin was cleaned from vegetable matter and surface soil, and is entirely surrounded by a stone wall 4½ feet deep. The overflow is opposite the gatehouse and is near the entrance from the chief supplying streams. The watershed has an area of 483 acres, and consists of pastures, woodland and some cultivated fields, there is in it one dwelling house situated about 1,000 feet from the water.

This reservoir, known as the Fairview Reservoir, was found of insufficient storage capacity, and in 1881 a small dam was con-

structed across Meadow Brook. This directs the water into a 24-inch cast iron pipe, extending a distance of 7,160 feet, and discharging into Fairview Reservoir near the dam. This source now supplies a considerable part of the water in this reservoir.

Meadow Brook is a small stream receiving its water chiefly from woodland. It is proposed to construct a large dam at this site and thus secure another storage reservoir of which the estimated capacity will be 1,000,000,000 gallons, area, 200 acres, length, 7,000 feet, average width, 1,250 feet. The watershed will have an area of 780 acres and will be chiefly woodland.

The distributing mains are of cast iron, wrought iron and cement. The service pipes are of lead.

Samples for analysis were furnished during two years on the 10th of each month, by the courtesy of Superintendent J. A. Brand, and were collected near the dam at Fairview Reservoir.

Analyses of Norwich Water Supply.

Samples from near the dam, Fairview Reservoir.

CHEMICAL EXAMINATION, 1889-90.

Figures indicate milligrams per liter, or parts per million. Water filtered through paper.

Date.	Color.	Residue on Evaporation.			Chlorine.	Nitrogen.				
		Total at 100° C.	Loss on Ignition.	Fixed.		Of Free Ammonia.	Of Albuminoid Ammonia.	Organic.	Of Nitrites.	Of Nitrates.
Aug. 12	0.4	44.5	18.0	26.5	2.25	0.030	0.210	0.350	0.000	0.02
Sept. 10	.4	39.0	14.0	25.0	2.00	.026	.110	.274	.001	02
Oct. 10	.6	37.5	11.0	26.5	2.25	.022	.168	.278	.000	.04
Nov. 11	.1	42.5	12.5	30.0	1.50	.024	.148	.266	.000	.05
Dec. 11	.3	36.5	11.0	25.5	2.50	.018	.126	.262	.001	.09
Jan. 15	.2	37.0	11.5	25.5	2.00	.002	.108	.186	.004	.11
Feb. 11	.3	34.0	7.5	26.5	2.50	.020	.154	.266	.004	.14
Mar. 12	.0	36.5	6.5	30.0	2.50	.034	.128	.212	.000	.14
Apr. 12	.1	31.5	5.0	26.5	2.75	.020	.164	.290	.001	.08
May 10	.2	34.0	10.5	23.5	2.13	.028	.126	.232	.000	.06
June 11	.2	38.0	10.0	28.0	2.25	.034	.166	.210	.000	.04
July 10	.1	32.0	8.0	24.0	2.50	.002	.118	.192	.000	.02
Average	.2	36.9	10.5	26.4	2.26	.022	.144	.252	.0009	.07

CHEMICAL EXAMINATION, 1890-91.

Figures indicate milligrams per liter, or parts per million, Water filtered through paper, except as noted.

Date.	Color.	Residue on Evaporation.			Chlorine.	Nitrogen.					Hardness as $CaCO_3$.	Oxygen consum'd from Permanganate ½ h. at 100°C.
		Total at 100° C.	Loss on Ignition.	Fixed.		Of Albuminoid Ammonia.	Of Free Ammonia not filtered.	Of Album'd Ammonia not filtered.	Of Nitrites.	Of Nitrates.		
Aug. 13..	0.10	34.5	6.0	28.5	2.43	0.120	0.008	0.116	0.000	0.01	9.	1.85
Sept. 12..	.20	36.0	7.5	28.5	2.45	.116	.028	.138	.000	.04	9.	3.00
Oct. 13..	.70	37.5	9.0	28.5	2.73	.170	.074	.160	.003	.06	9.	5.40
Nov. 11..	.80	43.5	11.5	32.0	2.85	.224	.058	.228	.001	.03	12.	7.90
Dec. 10..	.50	41.5	7.0	34.5	3.35	.154	.038	.162	.000	.08	11.	6.10
Jan. 10..	.40	37.0	11.5	25.5	2.80	.178	.048	.236	.000	.08	8.	6.55
Feb. 13..	.30	35.5	10.0	25.5	2.58	.114	.014	.132	.000	.06	6.	5.05
Mar. 13..	.20	29.0	3.5	25.5	2.30	.102	.016	.104	.000	.04	6.	3.80
Apr. 10..	.25	25.0	6.0	19.0	2.70	.122	.020	.130	.001	.05	6.	3.60
May 16..	.20	30.0	8.5	21.5	2.50	.124	.024	.138	.000	.04	6.	4.05
June 11..	.20	31.0	10.0	21.0	2.63	.218	.038	.220	.001	.00	5.	4.30
Average	.35	34 6	8.2	26.4	2.67	.149	.033	.160	.0005	.04	8.	4.69

REMARKS.—The odor was usually described as slight, swampy, or musty, once strong, musty. Usually nearly clear, other times turbid. The sediment was very scanty.

MICROSCOPICAL EXAMINATION, 1889-90, 1890-91.

Figures show average organisms per cubic centimeter of water, * means present in small number. First year in Roman type, second year in full face type.

	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July
DIATOMACEÆ—												
Asterionella	----	----	*	----	----	----	80	----	----	----	10	*
Pinellaria	----	----	----	**2**	----	----	----	----	----	----	----	----
Tabellaria	----	----	*	2	----	----	40	----	170	2	*	----
Navicula	----	----	----	----	----	----	----	**2**	**2**	----	----	----
Nitzschia	----	----	----	----	----	----	40	----	----	----	----	----
	6	----	----	----	----	----	----	----	----	----	----	----
Orthosira	----	----	----	----	*	----	----	----	----	----	----	----
	5	**30**	**13**	**10**	----	----	----	----	**6**	----	----	----
Gomphonema	----	----	----	----	----	*	----	----	----	----	----	----
Melosira	----	----	1	----	----	----	----	----	----	----	----	----
Synedra	8	----	----	----	----	----	----	----	----	----	----	----
DESMIDACEÆ—												
Staurastrum	----	----	----	----	----	----	----	----	----	----	1	*
	2	**3**	----	----	----	----	----	----	*	*	----	----
Closterium	----	----	----	----	----	----	----	----	----	*	*	----
CYANOPHYCEÆ—												
Merismopedia	----	**2**	----	----	----	----	----	----	----	----	----	----
Anabæna	----	**4**	----	----	----	----	----	**14**	**11**	**16**	**16**	----
OTHER ALGÆ—												
Protococcus	70	----	----	----	----	----	*	----	*	*	*	----
	10	----	**11**	**8**	*	**2**	*	----	----	----	----	----
Polyedrium	1	----	----	----	----	----	----	----	----	----	----	----

	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July
Rhaphidium				2								
Pediastrum		*									3	
Cœlosphærium			*									
Scenedesmus										*	8	
Conferva			20									
		27										
ANIMALS—												
Actinophrys					*							
	*											
Difflugia			3									
Peridineum			*					2	5	*	1	10
	41							2	2	*	8	
Anuræa				*		*					*	0.4
	3	*									4	
Polyarthra											1	
Asplanchna											*	
	*											
Eosphora												*
Volvox											*	
Glaucoma	4											
Uroglena										*		
Euglena			5									
Pandorina			*									
			2									
Dinobryon									2	5	500	100
			7						2			
Cyclops	*				*						*	2
	*	*										

SUMMARY.

	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July
Diatomaceæ			1	2			160		170	2	10	*
	19	30	13	12				2	8			
Desmidaceæ										*	1	*
Cyanophyceæ		6						14	11	16	16	
Protococcaceæ	71			2			*	*	*	*	*	
	12	3	11	8	*	2	*	14	11	16	27	
Conferva			20									
		27										
Rhizopoda			3		*							
	*											
Rotifera								2	5	*	2	10
	3	*									4	
Infusoria	4		5						2	5	500	100
	41		9					2	9	*	8	
Crustacea	*				*						*	2
	*	*										

REMARKS FOR THE YEAR ENDING JULY, 1890.

December—Large quantities of yellowish debris and fragments of higher plants.
February—Numerous fragments of higher plants.
March—Numerous fragments of higher plants, and considerable inorganic sediment.
April—Moderate amount of debris.
May—Numerous fragments of higher plants, but little yellowish debris.
June—Moderate quantity of fragments and debris.

BACTERIOLOGICAL EXAMINATION, 1889-90.

	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July
Average No. bacteria per c. c.	123	465	1714	93	1096	279	765	188	377	444	544	31
Temperature of water at time of collection ° F.	75	71	58	45	42	36	35	38	47	56	70	74
Temperature of air monthly mean (10th-10th) ° F.*	....	....	....	....	....	33.4	32.1	40.9	51.9	61.4	68.9	72.0
Precipitation during month (10th-10th) in inches*	10.68	2.36	6.31	5.91	5.66	1.86	3.86	4.21	6.90	4.35	3.54	0.74

* From records of Norwich Water Department.

BACTERIOLOGICAL EXAMINATION, 1890-91.

	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June
Average No. bacteria per c. c.	102	234	305	109	130	398	262	167	136	107	402
Temperature of water at time of collection ° F.	73	70	47	50	33	34	38	40	46	60	67
Temperature of air monthly mean (10th-10th) ° F.*	69.1	67.4	48.1	35.2	27.9	33.7	33.1	39.2	54.9	60.9	68.8
Precipitation during month (10th-10th) in inches*	3.53	3.09	6.99	4.70	2.63	4.78	7.30	5.81	2.93	3.26	1.52

* From records of the Norwich Water Department.

REMARKS.—The bacteria most abundant and frequent were white solid and white liquefying forms. Fluorescent, solid, pink solid, yellow solid, bluish white solid, green and yellow liquefying and purple forms were also seen from time to time.

(9). THOMASTON.

Population 985 (village). Consumption of water unknown. The supply comes from an artificial reservoir constructed by the Thomaston Water Co. in 1880. The reservoir was formed by a masonry dam across a small stream. The area flooded is 36 acres, and was a swampy field from which the muck and surface loam were not removed. It has a large area of shallow flowage. There is usually no overflow during the summer, the supply being only the small stream and numerous springs. The watershed comprises a few acres of meadow and pasture land surrounding and sloping toward the reservoir, the rest being a rough woodland with some swamps. During the warm months, the water supports an excessive growth of small floating algæ, which render it unfit for drinking.

The distributing mains are cast iron, the service pipes are galvanized iron.

Samples for analysis were furnished during two years on the 20th of each month by Dr. R. S. Goodwin, of the State Board of Health, and were drawn from a faucet in Thomaston.

Analyses of Thomaston Water Supply.

Samples taken from a tap in Thomaston.

CHEMICAL EXAMINATION, 1889-90.

Figures indicate milligrams per liter, or parts per million. Water filtered through paper.

Date.	Color.	Residue on Evaporation.			Chlorine.	Nitrogen.				
		Total at 100° C.	Loss on Ignition.	Fixed.		Of Free Ammonia.	Of Albuminoid Ammonia.	Organic.	Of Nitrites.	Of Nitrates.
Aug. 22	0.4	51.0	29.0	22.0	1.00	0.012	0.346	0.734	0.000	0.01
Sept. 18	.4	64.0	28.5	35.5	2.00	.210	.492 +	.970	.000	.02
Oct. 19	.2	41.0	10.5	30 5	1.75	.009	.306	.590	.000	.03
Nov. 19	.1	36.5	15.0	21.5	1.75	.086	.200	.374	.002	.09
Dec. 20	.1	29.0	7.5	21.5	1.25	.043	.132	.244	.003	.14
Jan. 22	.1	24.5	8.0	16.5	1.75	.020	.126	.286	.002	.18
Feb. 20	.1	25.5	7.0	18.5	1.75	.024	.138	.222	.003	.06
Mar. 21	.1	23.5	6.0	17.5	1.38	.012	.142	.174	.000	.04
Apr. 22	.1	25.5	8.5	17.0	1.85	.016	.134	.194	.000	.05
May 21	.1	27.0	9.5	17.5	1.25	.062	.178	.288	.001	.05
June 19	.2	35.0	11.5	23.5	1.13	.162	.180	.252	.000	.07
July 21	.3	32.5	14.5	18.0	1.25	.040	.368	.714	.000	.04
Average	.2	34.6	13.0	21.6	1.51	.058	.229	.420	.0009	.07

CHEMICAL EXAMINATION, 1890-91.

Figures indicate milligrams per liter, or parts per million. Water filtered through paper, except as noted.

Date.	Color.	Residue on Evaporation. Total at 100° C.	Loss on Ignition.	Fixed.	Chlorine.	Nitrogen. Of Albuminoid Ammonia.	Of Free Ammonia not filtered.	Of Album'd Ammonia not filtered.	Of Nitrites.	Of Nitrates.	Hardness as $CaCO_3$.	Oxygen consum'd from Permanganate ½ h. at 100° C.
Aug. 20	0.05	45.5	25.5	20.0	1.65	0.522	0.340	0.686	0.000	0.03	7.	5.00
Sept. 20	.40	45.0	23.0	22.0	1.65	.364	.198	.758	.000	.03	6.	7.50
Oct. 20	.20	34.0	11.5	22.5	1.45	.230	.114	.488	.000	.12	12.	6.85
Nov. 20	.20	36.0	15.5	20.5	1.50	.224	.172	.232	.008	.20	11.	5.35
Dec. 19	.20	36.5	13.5	23.0	1.75	.252	.118	.282	.004	.24	8.	6.00
Jan. 20	.15	30.5	9.0	21.5	1.58	.196	.200	.202	.002	.24	10.	4.25
Feb. 20	.40	31.5	8.5	23.0	1.25	.136	.254	.148	.002	.10	6.	3.15
Mar. 20	.15	26.5	7.0	19.5	1.20	.078	.190	.122	.001	.07	7.	2.55
Apr. 23	.05	18.0	6.5	11.5	1.55	.142	.052	.168	.000	.16	5.	2.70
May 20	.20	21.0	8.0	13.0	1.38	.192	.040	.350	.000	.06	5.	4.10
June 19	.20	28.0	11.0	17.0	1.25	.312	.332	.510	.001	.08	7.	3.65
Average	.20	32.0	12.6	29.4	1.47	.232	.183	.359	.0015	.12	8.	4.65

REMARKS.—The odor was usually distinct or marked and described as disagreeable, fishy, swampy, stale. Usually turbid or very turbid, and during the warm months filtered very slowly, the filtrate being still turbid. The sediment was generally scanty or moderate, but sometimes considerable or much, and was yellow or greenish, fine or flocculent.

MICROSCOPICAL EXAMINATION, 1889-90, 1890-91.

Figures show average organisms per cubic centimeter of water, * means present in small number. First year in Roman type, second year in full face type.

	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July
DIATOMACEÆ—												
Asterionella				20	30	180	120	80	180	90	20	300
	7											
Surirella				*					*			
Tabellaria		*	*	6					3	3		*
				10		*	*		*		*	
Nitzschia				26	60	140	20	70	750			
										55	**24**	
Stauroneis							*					
Tetracyclus							*					
Cocconema									*			
Orthosira		*							400			100
	92	**89**	**17**	**30**				**9**	**25**	**71**	**61**	
Melosira		*										
CYANOPHYCEÆ—												
Anabæna				**7**								
Clathrocystis		*								*		
Gleocystis	**11**											
Merismopedia			6	*								
				*					*			
DESMIDACEÆ—												
Staurastrum	80	30		10					0.5	10	0.5	50
	40		*	*					*		*	
Hyalotheca									**2**			

	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July
OTHER ALGÆ—												
Protococcus	200000	190000	1500		*				50	*	250	22000
	3670	**1160**	**21**	**11**	**8**	**21**	**9**	**19**	**14**	**20**	**41**	
Large single cells (Protococ's?)			150									
Scenedesmus	600	4000	120	50	*				50	500	70	500
	95	*	**20**			**16**	*		**31**	**6**	**14**	
Polyedrium	60											50
	14	*										
Rhaphidium	120		64	*					*	50		100
	8	**5**	**2**			**15**			*			
Pediastrum	100	40	18	4	3			*	2	76	2	20
	36	*	**6**						*		*	
Ophiocytium												20
	16											
Spirogyra									*	*		
Conferva	100	200	14	30						50		
Mesocarpus		*										
Spores						75	*	*				
FUNGI—												
Crenothrix										10		*
PROTOZOA—												
Difflugia			*									
Amœba									*			
Anuræa					*		4	*	*	5	0.2	*
	*					**4**			*	**8**	*	
Notholca					*						*	**2**
Peridineum						4	7	*	*			2
	*	**35**			*	**3**	**4**				**4**	
Noteus		*										
Epistylis		*										
Phacus											*	1
Trachelomonas	**13**		4				4		**3**	**5**	8	
Dinobryon				2500	1000							500
						7						
Euglena									*	*		
	*											
Cyclops												*

SUMMARY.

	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July
Diatomaceæ				52	90	320	140	150	1330	93	20	400
	99	**89**	**17**	**40**		*	*	**9**	**25**	**126**	**125**	
Cyanophyceæ		*								*		
	11			**9**					*			
Desmidaceæ	80	30		10					0.5	10	0.5	50
	40	*	*	*					*		*	
Protococcaceæ	201000	194000	1688	54	3			*	102	626	322	22690
	3835	**1165**	**54**	**11**	8	**52**	**9**	**19**	**45**	**26**	**55**	
Confervaceæ	100	200	14	30						50		
Rhizopoda												
			*									
Rotifera					*			*	*	5	0.2	*
	*					**4**			*	**8**	*	
Infusoria		*		2500	1000	4	7	*	*	*	*	503
	13	*	**4**	*		**10**	**8**		**3**	**5**	**9**	
Crustacea												*

REMARKS FOR THE YEAR ENDING JULY, 1890.

August—Plants almost wholly alive; but little yellowish debris.
September—Animal life dead; some yellowish debris.
October—Moderate amount of debris.
November—But little debris.
January—Fragments of plants.
February—Numerous fragments of higher plants.
March—Numerous fragments of higher plants.
April—Moderate amount of debris.
July—Large quantities of debris.

BACTERIOLOGICAL EXAMINATION, 1889-90.

	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July
Average No. bacteria per c. c..	317	1029	278	3313	2271	291	186	203	720	349	1472	317
Temperature water at time of collection ° F..	65	65	52	45	41	40	39	38	45	54	60	66

BACTERIOLOGICAL EXAMINATION, 1890-91.

	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
Average No. bacteria per c. c............	268	1263	605	298	355	54	139	97	298	279	474
Temperature water at time of collection ° F.	68	65	54	48	37	40	40	41	56	35	65

REMARKS.—The bacteria most abundant were green and white liquefying forms. There were present occasionally fluorescent solid, bluish white irregular solid, white solid and yellow liquefying forms. No data relating to rainfall or temperature could be obtained.

(10). WATERBURY.

Population, 28,646 (city). Average daily consumption of water, 1,500,000 gallons. The water works are owned by the city and were begun in 1867, additional reservoirs were constructed in 1880–81, and the construction of a new system embracing Hop Brook and Quassapaug Lake is now contemplated.

There is a distributing reservoir of 10,000,000 gallons on Cooke street, which receives water from a small stream supplied

by springs, but is chiefly supplied by gravity from the East Mountain system or by pumping from Mad River. *Mad River* is a small stream flowing through a region containing many dwellings and is used only as an emergency supply.

The East Mountain System comprises one distributing and two storage reservoirs. The water is impounded by sand and gravel dams. The distributing reservoir has a capacity of 8,000,000 gallons, and the storage reservoirs together, an area of 60 acres and a capacity of 167,000,000 gallons. About one-fourth is shallow flowage. The water comes from springs and small streams from the watershed, which has an area of one and a half square miles and is composed mostly of open pastures with little woodland. It is free from house drainage.

The samples for analysis were furnished by the courtesy of the president of the board, Mr. N. J. Welton, and were taken for two years on the 20th of each month, from near the dam of the larger storage reservoir.

Analysis of Waterbury Water Supply (East Mountain).

Samples taken from near dam in storage reservoir.

CHEMICAL EXAMINATION, 1889-90.

Figures indicate milligrams per liter, or parts per million. Water filtered through paper.

Date.	Color.	Residue on Evaporation.			Chlorine.	Nitrogen.				
		Total at 100° C.	Loss on Ignition.	Fixed.		Of Free Ammonia.	Of Albuminoid Ammonia.	Organic.	Of Nitrites.	Of Nitrates.
Aug. 19	0.1	33.0	13.0	20.0	1.88	0.012	0.132	0.254	0.000	0.01
Sept. 18	.1	32.5	10.5	22.0	1.75	.010	.162	.290	.000	.02
Oct. 20	.1	31.5	6.5	25.0	2.00	.036	.188	.384	.000	.03
Nov. 21	.0	28.0	9.5	18.5	1.88	.014	.174	.216	.000	.05
Dec. 20	.0	25.5	7.5	18.0	2.00	.044	.188	.406	.001	.06
Jan. 22	.0	27.0	8.0	19.0	2.25	.022	.132	.264	.002	.20
Feb. 20	.0	25.0	6.5	18.5	1.50	.022	.142	.194	.002	.06
Mar. 20	.0	26.5	6.0	20.5	1.88	.004	.130	.172	.001	.08
Apr. 22	.0	28.5	6.5	22.0	2.75	.008	.098	.212	.000	.05
May 21	.0	30.5	8.0	22 5	2.25	.024	.176	.286	.000	.03
June 20	.1	30.0	10.0	20.0	2.13	.046	.172	.388	.000	.00
July 21	.0	32.0	8.5	23.5	2.63	.018	.232	......	.000	.02
Average	.03	29.2	8.4	20.8	2.08	.022	.161	.279	.0005	.05

CHEMICAL EXAMINATION, 1890-91.

Figures indicate milligrams per liter, or parts per million. Water filtered through paper, except as noted.

Date.	Color.	Residue on Evaporation.			Chlorine.	Nitrogen.					Hardness as $CaCO_3$.	Oxygen consum'd from Permanganate ½ h. at 100° C.
		Total at 100° C.	Loss on Ignition.	Fixed.		Of Albuminoid Ammonia.	Of Free Ammonia not filtered.	Of Album'd Ammonia not filtered.	Of Nitrites.	Of Nitrates.		
Aug. 20..	0.10	36.5	13.5	23.0	2.28	0.298	0.022	0.408	0.000	0.02	8.	2.35
Sept. 20..	.10	34.5	8.0	26.5	2.00	.174	.026	.264	.001	.02	7.	3.40
Oct. 20..	.10	32.5	9.0	23.5	1.85	.188	.024	.264	.000	.05	6.	2.80
Nov. 20..	.05	28.5	8.5	20.0	2.00	.166	.026	.284	.003	.04	8.	3.30
Dec. 19..	.05	26.0	5.5	20.5	1.88	.096	.048	.218	.000	.05	9.	3.35
Jan. 20..	.05	25.0	5.0	20.0	1.83	.188	.048	.190	.000	.08	8.	2.45
Feb. 20..	.20	27.5	6.5	21.0	1.50	.138	.020	.214	.002	.04	5.	3.35
Mar. 20..	.10	27.0	8.0	19.0	1.83	.134	.040	.164	.000	.04	4.	2.95
Apr. 21..	.10	23.5	6.0	17.5	2.20	.158	.036	.202	.000	.03	4.	2.90
May 20..	.20	23.0	7.0	16.0	1.55	.136	.010	.156	.000	.02	5.	2.25
June 19..	.05	23.0	7.5	15.5	1.83	.194	.042	.214	.000	.05	4.	3.10
Average .	.10	28.0	7.7	20.3	1.89	.170	.031	.234	.0005	.04	6.	2.93

REMARKS.—The odor was usually slight or none, but in July, August, and September, 1890, was described as peculiar and disagreeable. Usually clear, occasionally turbid from fine suspended vegetable matter. The sediment was usually very scanty, occasionally moderate, light flocculent.

MICROSCOPICAL EXAMINATION, 1889-90, 1890-91.

Figures show average organisms per cubic centimeter of water, * means present in small number. First year in Roman type, second year in full face type.

	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July
DIATOMACEÆ—												
Asterionella	115	12	125	10	24	20	20	23	10	2	5	10
										45	**32**	
Synedra		*	*	*		*	*	*	*			
				3						**10**		
Tabellaria	160	12	135	2	3	2	*	10	5	2		
				39					**16**	**33**	**28**	
Navicula									*			
	3	**5**	*****								**6**	
Stauroneis				**3**								
Surirella								*	*	*		
Nitzschia		*	35	*	60	*	*	50	15	80	*	*
Pinnularia			10									
				*****								
Gomphonema								*				
Orthosira	60	90	800	50	180	*	*	*	50	140	10	*
	65	**22**	**186**	**37**	**7**		*****		**42**	**138**	**42**	
Melosira		2										
CYANOPHYCEÆ—												
Merismopedia		**3**		**3**						**3**		
Clathrocystis		2	2									
	3											
Anabæna	6	3										
	4			**3**								
Undetermined		40										
Glœocystis				**2**								

	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July
DESMIDACEÆ—												
Staurastrum	6	4	3					2				
	3	**6**		*								
Cosmarium		*										
				*								
Ophiocytion			2									
	*											
Sphærozosma			*									
OTHER ALGÆ—												
Protococcus	500	*	*	*								
	21	**95**	**16**	**39**	**3**	**17**	**10**	**24**	**22**	**29**	**31**	
Scenedesmus	3		20									
	3	**48**	*	**5**						**6**	**10**	
Rhaphidium												2
		61		**13**								
Polyedrium		*										
	*	**6**										
Pediastrum			8									
	*	**6**										
Conferva	2	4		8						1		*
Spirogyra									*		*	
Spores							*	25	*			
ANIMALS—												
Actinophrys											*	
	*			**5**		**6**		**6**	*			
Anuræa		*	*	1		*	*		1	0.6		*
				2	*				**4**	**4**	**3**	
Peridineum		60	*	*	*	10	15	20	8	*	1	45
	71	**5**	**2**	**5**			**9**	**20**	**22**	**11**	**8**	
Polyarthra							*	*				
Pandorina			*							*		
Eosphora												*
Dinobryon								200				
				9		**10**	**7**	**15**	**25**			
Trachelomonas												*
	*	**4**	**7**	**3**					**7**	**3**	**5**	
Phacus			*	*								
Lepocinclus											*	
Euglena	*											
Cyclops				0.2			*					
	*		*	**0.4**					*	*	*	

SUMMARY.

	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July
Diatomaceæ	355	116	1105	62	267	22	20	83	80	225	15	10
	68	**27**	**186**	**82**	**7**		*	*	**58**	**226**	**108**	
Cyanophyceæ	6	45	2									
	7	**3**		**9**								
Desmidaceæ	6	4	5					2				
	3	**6**		*								
Protococcaceæ	503	*	28	*								20
	24	**215**	**16**	**57**	**3**	**17**	**10**	**24**	**22**	**35**	**41**	
Conferva	2	4		8					*	1	*	*
Rhizopoda											*	*
	*			**5**		**6**		**6**	*			
Rotifera		*	*	1		*	*	*	1	0.6		*
				2	*				**4**	**4**	**3**	
Infusoria		60	*	*	*	10	15	220	8	*	1	45
	71	**9**	**9**	**19**		**10**	**16**	**35**	**56**	**14**	**13**	
Crustacea				0.2			*					
	*		*	**0.4**					*	*	*	

REMARKS FOR THE YEAR ENDING JULY, 1890.

November—Considerable debris.
February—Large quantities of fragments of higher plants.
March—Moderate quantities of broken fragments.
April—Considerable debris.
May—Numerous fragments and considerable yellow debris.
June—Moderate amount of debris.

BACTERIOLOGICAL EXAMINATION, 1889-90.

	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July
Average No. bacteria per c. c..	382	1686	185	356	3423	202	887	399	1558	331	420	127
Temperature of water at time of collection ° F..	73	70	50	43	38	33	35	36	52	61	65	71
Temperature air monthly mean* ° F.		76.3	50.1	45.	36.	34.7	31.8	30.4	41.3	54.5	62.4	73.
Precipitation monthly mean in inches*....	68. 7.77	3.98	3.	5.39	7.21	2.21	3.63	3.79	4.88	4.99	4.38	2.21
Total precipitati'n during month.	2.76	4.26	4.03	8.74	2.74	2.54	3.77	6.08	2.43	5.97	3.26	4.96

* From the records of Waterbury Water Department.

BACTERIOLOGICAL EXAMINATION, 1890-91.

	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
Average No. bacteria per c. c............	340	548	1981	92	565	216	158	204	231	56	396
Temperature of water at time of collection ° F.	71	68	52	--	33	34	34	40	54	59	70
Temperature air, monthly mean ° F.*	70.9	65.6	53.3	42.5	25.2	23.3	30.5	32.1	43.2	53.4	65
Precipitation, monthly mean in inches.* ...	5.77	6.85	5.28	2.85	3.96	6.83	7.97	5.26	5.77	1.49	1.04
Total precipitation during month.........	4.50	4.98	6.89	.93	5.21	10.06	5.65	5.08	3.86	1.84	..

* From the records of Waterbury Water Department.

REMARKS.—The bacteria most commonly present were a white liquefying and a greenish liquefying form. There was found on the plates at various times colonies of a solid fluorescent, solid pink, solid and liquefying yellow, solid white of two kinds, one forming round colonies, the other white colonies with an irregular outline, and a solid bluish white colony.

Additional Analyses of Waterbury Samples.

CHEMICAL EXAMINATION.

Figures indicate milligrams per liter, or parts per million. Water filtered through paper.

	Date.	Color.	Residue on Evaporation.			Chlorine.	Nitrogen.			
			Total at 100° C.	Loss on Ignition.	Fixed.		Of Free Ammonia.	Of Albuminoid Ammonia.	Of Nitrites.	Of Nitrates.
	1889									
Cooke St. Res.	Sept. 7	0.0	53.5	13.0	40.5	1.95	0.008	0.032	0.001	0.02
" "	Oct. 10	.0	38.0	6 5	31.5	2.50	.094	.196	.002	.01
	1890									
" "	Aug. 21	.05	42.5	7.5	35.0	2.00	.016	.110	.000	.01
" " Tap.	Aug. 21	.05	38.5	10.0	28.5	2.10	.014	.114	.001	.01
	1889									
Mad River	July 14	.3	37.5	9.5	28.0	4.13	.026	.188	.001	.09
Hop Brook*	Oct. 10	1.0	47.5	8.5	39.0	3.08	.024	.154	.002	.09
" "	Nov. 11	.4	46.0	12.5	33.5	1.88	.028	.152	.003	.14
	1890									
" "	July 14	.2	45.0	7.5	37.5	2.00	.024	.118	.004	.16
" "	Aug. 21	.8	38.5	10.0	28.5	1.88	.034	.186	.002	.04
	1889									
Lindley Brook*....	Nov. 11	.0	31.0	7.0	24.0	2.00	.008	.090	.002	.08
	1890									
" "	July 14	.1	29.0	8.5	20.5	1.75	.014	.082	.000	.06
	1889									
Chestnut Hill*	Nov. 11	.1	30.0	9.0	21.0	2.00	.060	.142	.003	.05
	1890									
" "	July 14	.0	25.0	10.0	15.0	2.00	.012	.170	.000	.04
	1889									
Quassapaug Lake*	Nov. 11	.0	28.5	10.5	18.0	1.63	.012	.114	.001	.05
	1890									
" "	July 14	.0	25.5	11.5	14.0	1.75	.022	.180	.000	.03

* Proposed new supplies.

(11). BRIDGEPORT.

Population, 48,866 (city and town). Average daily consumption of water, 10,000,000 gallons.

The water is supplied by the Bridgeport Hydraulic Company, from several sources. There is a distributing reservoir which receives water from the Pequannoc River and from the Island Brook system; there is also the Mill River supply.

The Pequannoc River.—The "Factory Pond" has an area of 62 acres, the shores are woody and cultivated, there being a few

dwelling houses on the left bank. Water is pumped from near the dam at a depth of 15 feet, but this source is used only when dry weather necessitates it. On the river, which is 15 miles long, there is situated the Trumbull reservoir, 2½ miles above the Factory Pond, and between them the river is dammed in three places for power, and there is a paper mill and a saw mill still in use.

Island Brook System.—Horse Tavern Brook Reservoir is an artificial pond of 7 acres area, which overflows into Ox Brook Reservoir situated across a road. The leakage from the dam is caught in a small basin situated close to the rear of a dwelling house, from which it is turned into the Ox Brook culvert.

The Ox Brook Reservoir, of an area of 15 acres, is connected with Island Brook Reservoir by means of a pipe and culvert. The culvert runs beside a traveled road and is imperfectly covered with paving stones.

The Island Brook reservoir is artificial and has an area of 62 acres, mostly shallow, with much rock bottom but soft shores. The water flows through an open brook, where it is well aerated, into a small reservoir, from which it passes through a filter containing one hundred bushels of charcoal, annually renewed, and then flows through pipes to the main distributing reservoir.

The Mill River Supply.—This is an artificial reservoir situated 7 miles from the city on Mill River, which is a small stream. The dam is of masonry, 45 feet high. The reservoir has an area of 42½ acres and a capacity of 209,000,000 gallons. It is deep in the channel but has considerable shallow area. The surface covered was mostly woodland. The banks are mostly steep, covered to the water's edge with trees, and uncultivated. The reservoir receives the drainage from this area and a small brook, besides the river water.

The water is conducted to the city through a 30-inch cast iron pipe, except for a distance of 2,400 feet, where it flows through a tunnel in gneiss and schistose rocks.

Distributing mains are of cast iron, wrought iron and cement. Service pipes are wrought iron and lead.

Samples for analysis were furnished for one year on the 20th of each month, by the courtesy of Dr. N. E. Worden of the State Board of Health, and were taken from a faucet on Fairfield avenue, which was supplied only with Mill River water.

Analyses of Bridgeport Water Supply (Mill River).

Samples taken from tap in the city.

CHEMICAL EXAMINATION, 1890-91.

Figures indicate milligrams per liter, or parts per million. Water filtered through paper, except as noted.

Date.	Color.	Residue on Evaporation. Total at 100° C.	Loss on Ignition.	Chlorine.	Nitrogen. Of Albuminoid Ammonia.	Of Free Ammonia not filtered.	Of Album'd Ammonia not filtered.	Of Nitrites.	Of Nitrates.	Hardness as $CaCO_3$.	Oxygen consum'd from Permanganate ½ h. at 100° C.
Aug. 20	0.40	50.5	13.0	2.70	0.166	0.058	0.178	0.001	0.04	17.	....
Sept. 20	1.00	56.5	20.5	2.63	.240	.030	.272	.001	.07	16.	10.45
Oct. 20	.70	51.0	14.0	2.98	.178	.026	.208	.001	.06	14.	6.05
Nov. 20	.30	43.0	11.0	2.63	.114	.012	.112	.003	.10	16.	4.90
Dec. 20	.20	41.0	7.0	2.73	.126	.008	.132	.002	.15	14.	4.90
Jan. 20	.15	30.0	7.0	1.88	.114	.014	.118	.000	.17	12.	3.80
Feb. 20	.30	36.0	7.0	1.58	.110	.014	.132	.000	.06	7.	4.40
Mar. 20	.15	32.5	8.0	2.00	.080	.018	.086	.001	.06	8.	3.25
Apr. 20	.20	31.5	7.5	2.43	.112	.018	.144	.001	.12	11.	4.00
May 20	.20	31.5	7.0	2.00	.146	.016	.162	.000	.10	12.	4.55
June 19	.30	35.5	6.0	2.00	.144	.034	.144	.001	.03	14.	4.20
Average	.35	39.9	9.8	2.32	.139	.023	.153	.0009	.09	13.	4.59

Remarks.—An odor was usually present, slight or distinct, and described as swampy, musty or earthy. Usually slightly turbid or turbid. The sediment was very scanty or scanty, brownish, flocculent.

MICROSCOPICAL EXAMINATION, 1890-91.

Figures show average organisms per cubic centimeter of water, * means present in small number.

	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July
Diatomaceæ—												
Orthosira	48	15	27	14	....	....	....	....	....	....	11	....
Fragillaria	5	....	....	....	....	....	....	....	....	....	....	....
Eunotia	6	....	....	....	....	....	....	....	....	....	....	....
Navicula	....	*	....	....	....	....	....	....	....	....	....	....
Asterionella	....	12	....	....	....	....	....	....	....	....	3	....
Gomphonema	....	....	*	....	....	....	*	....	....	....	....	....
Tabellaria	....	....	....	7	....	....	....	....	9	43	....	....
Synedra	....	....	....	....	....	....	....	4	3	....	....	....
Cyanophyceæ—												
Glœocystis	25	....	....	....	....	....	....	....	....	....	....	....
Desmidaceæ—												
Closterium	....	....	....	....	....	....	....	....	*	....	....	....
Protococcaceæ—												
Scenedesmus	39	2	....	....	....	....	....	....	*	13	17	....
Protococcus	46	16	10	11	....	1	7	15	11	32	38	....
Rhaphidium	10	5	10	....	....	....	....	....	....	5	....	....
Pediastrum	2	....	*	....	....	....	....	....	....	....	....	....
Rhizopoda—												
Infusoria—												
Peridineum	24	2	....	....	....	....	....	*	....	2	4	....

	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July
Trachelomonas	26	2	3	----	----	*	----	2	5	4	6	----
Euglena	2	*	----	----	----	----	----	----	----	----	----	----
Dinobryon	25	----	----	----	----	----	4	----	----	----	----	----
ROTIFERA—												
Anuræa	----	*	2	----	----	----	----	----	----	2	----	----
CRUSTACEA—												
Sponge spicules	----	----	----	----	----	----	----	2	----	----	----	----

SUMMARY.

	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July
Diatomaceæ	59	15	27	21	----	----	*	4	12	43	14	----
Cyanophyceæ	25	----	----	----	----	----	----	----	----	----	----	----
Desmidaceæ	----	----	----	----	----	----	----	----	*	----	----	----
Protococcaceæ	97	23	29	11	----	1	7	15	11	50	55	----
Confervaceæ	----	----	----	----	----	----	----	----	----	----	----	----
Rhizopoda	----	----	----	----	----	----	----	----	----	----	----	----
Infusoria	77	4	3	----	----	*	4	2	5	6	10	----
Rotifera	----	*	2	----	----	----	----	----	----	----	2	----
Crustacea	----	----	----	----	----	----	----	----	----	----	----	----
Sponge Spicules	----	----	----	----	----	----	----	2	----	----	----	----

BACTERIOLOGICAL EXAMINATION, 1890-91.

	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June
Average No. Bacteria per c. c.	157	548	445	133	948	36	215	155	99	122	585
Temperature water at time of collection ° F.	77	68	58	51	..	42	44	49	56	62	69

REMARKS.—Bacteria mostly green and white liquefying forms,—white solid, fluorescent and yellow liquefying forms were also noted.

No records could be obtained regarding rainfall and temperature.

(12). DANBURY.

Population, 16,552 (city). Consumption of water unknown.

The works are owned by the city, and were begun in 1860. There are four artificial storage reservoirs supplied by small streams and flowage from the watersheds, which consist chiefly of woodland and pasture.

The Lower Kohanza was constructed in 1860, and has an area of 8 acres, with an average depth of 12 feet. It is now used as a

distributing reservoir and is 2 miles from the city. The Upper Kohanza was built on the same stream in 1866, has an area of 33 acres, an average depth of 11 feet, and is 3 miles from the city. The Padanaram was built in 1883, has an area of 20 acres, an average depth of 18 feet, and is 3 miles from the city. It is used as a distributing reservoir independent of the Lower Kohanza. The fourth reservoir, East Lake, was built in 1885, has an area of 73 acres, an average depth of 17 feet, and is 4½ miles from the city.

The sites of these reservoirs were formerly meadows and pastures except that of the Upper Kohanza, which was woodland.

The distributing mains are of cement and iron, and the service pipes are iron.

Samples for analysis were taken from Padanaram reservoir on or about the 20th of each month, and were furnished by the courtesy of the Superintendent, Mr. C. B. Mason.

Analyses of Danbury Water Supply.

Samples taken from Padanaram Reservoir.

CHEMICAL EXAMINATION, 1889-90.

Figures indicate milligrams per liter, or parts per million.

Date.	Color.	Residue on Evaporation. Total at 100° C.	Loss on Ignition.	Fixed.	Chlorine.	Nitrogen. Of Free Ammonia.	Of Albuminoid Ammonia.	Organic.	Of Nitrites.	Of Nitrates.
Aug. 19	0.1	65.0	18.0	47.0	2.00	0.012	0.204	0.344	0.000	0.02
Sept. 18	.3	60.0	11.0	49.0	2.25	.022	.214	.438	.000	.08
Oct. 19	.2	53.5	8.0	45.5	2.25	.008	.146	.252	.000	.05
Nov. 20	.1	47.5	10.5	37.0	1.75	.012	.118	.218	.001	.09
Jan. 7	.3	44.0	10.0	34.0	1.25	.010	.110	.210	.003	.10
Jan. 26	.1	46.0	8.5	37.5	2.38	.026	.138	.360	.005	.24
Feb. 26	.0	31.0	6.5	24.5	2.13	.018	.100	.208	.001	.18
Apr. 8	.0	40.0	8.5	31.5	1.88	.022	.126	.218	.001	.12
Apr. 22	.1	43.0	10.0	33.0	2.13	.012	.110	.172	.001	.10
May 23	.1	44.0	9.5	34.5	1.63	.030	.168	.320	.000	.03
June 20	.1	57.0	13.5	43.5	1.38	.028	.178	.286	.000	.06
July 31	.1	51.5	7.5	44.0	1.88	.100	.294	....	.001	.02
Average	.1	48.5	10.1	38.4	1.91	.025	.159	.275	.0011	.09

Remarks.—The odor was slight, swampy or vegetable. Frequently slightly turbid or turbid. The sediment was scanty, moderate or considerable, fine or brown and flocculent.

MICROSCOPICAL EXAMINATION, 1889-90.

Figures show average organisms per cubic centimeter of water, * means present in small number.

	Aug.	Sept.	Oct.	Nov.	Jan. 7	Jan. 26	April 8	April 22	May	June
DIATOMACEÆ—										
Asterionella	4	30	27	200	5	70	1250	20	160	5
Synedra			*		*					
Tabellaria	360	300	55	200	20		12	7	5	20
Nitzschia	60	25	40		*	25	20	280	200	20
Pinnularia			*							
Stauroneis							*	*	*	
Cymbella			*							
Gomphonema			*					*	*	
Navicula										*
Orthosira		50	100		50			46		20
Melosira	75	*	*							
CYANOPHYCEÆ—										
Clathrocystis										
Anabæna	2									
Sphærozyga					3					
DESMIDACEÆ—										
Staurastrum	1	2	*		3				8	2
Closterium	*							*		
Cosmarium			*							
Sphærozosma					24					
Hyalotheca									10	
OTHER ALGÆ—										
Protococcus	50	50				150		*	100	1250
Scenedesmus	5	5	*					*	40	50
Polyedrium		*								
Rhaphidium	*	110	40	40	*	20	*			
Pediastrum	0.5	2	1	*	2	*	*			
Conferva	2	5	25	*						
Spores							40	*		
FUNGI—										
Crenothrix				*						
ANIMALS—										
Amœba		2								
Difflugia			3	0.6	2	*				
Anuræa		2	*		*			1	*	*
Peridineum			5.2				*	10		*
Polyarthra			0.5							*
Colurus										*
Eosphora										
Glaucoma	2	5								
Aspidisca							*			*
Nassula										*
Euglena										*
Pandorina		*	*							
Undetermined Infusoria					10					2
Cyclops		1								

SUMMARY.

	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July
Diatomaceæ	499	405	222	400	75	95	....	1282	353	365	65	....
Cyanophyceæ	2	....	....	....	3	....	....	....	....	....	....	....
Desmidaceæ	1	2	....	....	27	....	....	....	....	18	2	....
Protococcaceæ	55	167	41	41	2	170	....	*	*	140	1300	....
Confervaceæ	2	5	25	....	....	....	....	....	....	....	....	....
Rhizopoda	....	2	3	0.6	2	*	....	....	....	....	....	....
Rotifera	....	2	*	....	*	....	....	....	1	*	....	....
Infusoria	2	5	5.7	....	10	....	....	*	10	....	2	....
Crustacea	....	1	....	....	....	....	....	....	....	....	....	....

Remarks for the Year ending July, 1890.

August—Very little debris: plant living.
September—Large quantities of yellowish debris.
October—Very large quantities of debris.
December—Very large quantities of debris and numerous fragments of higher plants.
February—Much debris.
March—Considerable debris.
April—Considerable debris.
May—Considerable debris.
June—Considerable debris.

BACTERIOLOGICAL EXAMINATION, 1889-90.

	Aug.	Sept	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July
Average No. bacteria per c. c.	346	9632	8322	3323	3504	4670	1803	274	267	728	492	....

Remarks.—The form of bacteria most abundant was a white liquefying one. White, pink, yellow and bluish-white solid and green liquefying colonies were also seen at times. This reservoir gave the largest number of bacteria per c. c. of any of the waters examined.

(13). STAMFORD.

Population, 15,700 (town). Average daily consumption of water, 1,000,000 gallons. The works were built in 1860 by the Stamford Water Company. The chief source is Trinity Lake, a natural lake situated fourteen miles from the city in the State of New York. Its capacity is 300,000,000 gallons, having been increased by a small masonry dam. There is a small reservoir of 6,500,000 gallons on Mill River, two miles from the city. The watershed supplying these sources is about 25 square miles, having little woodland, but consisting chiefly of pastures and meadows.

Distributing mains are cast iron, wrought iron and cement. Service pipes are of lead.

Samples were furnished by the courtesy of Superintendent George E. Whitney, and were drawn from a tap in the city on or about the 20th of each month, for one year.

Analyses of Stamford Water Supply.

Samples taken from a tap in the city.

CHEMICAL EXAMINATION, 1889-90.

Figures indicate milligrams per liter, or parts per million.

Date.	Color.	Residue on Evaporation.			Chlorine.	Nitrogen.				
		Total at 100° C.	Loss on Ignition.	Fixed.		Of Free Ammonia.	Of Albuminoid Ammonia.	Organic.	Of Nitrites.	Of Nitrates.
Aug. 16	0.3	59.5	14.0	45.5	1.75	0.012	0.164	0.314	0.003	0.02
Oct. 4	.3	67.0	12.0	55.0	2.75	.014	.154	.286	.000	.04
Oct. 19	.1	61.5	8.0	53.5	2.25	.008	.100	.202	.000	.03
Nov. 20	.1	51.5	11.5	40.0	2.62	.018	.104	.202	.001	.07
Dec. 20	.2	43.5	6.0	37.5	1.75	.018	.086	.152	.001	.09
Jan. 22	.1	44.0	7.5	36.5	2.50	.008	.096	.208	.002	.14
Feb. 20	.0	43.5	5.5	38.0	2.38	.014	.092	.142	.000	.10
Mar. 20	.1	40.5	5.5	35.0	2.25	.004	.108	.128	.000	.10
Apr. 22	.1	48.5	9.0	39.5	2.25	.008	.106	.172	.000	.08
May 21	.3	52.5	10.0	42.5	2.25	.022	.138	.248	.001	.06
June 20	.2	58.0	10.5	47.5	1.75	.018	.136	.256	.000	.04
July 21	.1	53.0	6.0	47.0	2.00	.018	.154	.266	.001	.06
Average	.16	51.9	8.8	43.1	2.21	.014	.120	.215	.0008	.07

Remarks.—The odor was slight and woody, or none. Nearly clear. The sediment was very scanty or moderate, and yellow or brown and flocculent.

MICROSCOPICAL EXAMINATION, 1889-90.

Figures show average organisms per cubic centimeter of water, * means present in small number.

	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July
DIATOMACEÆ—												
Synedra			*				*					
Tabellaria				*								
Epithemia									5			
Cocconema									*			
Stauroneis									*	5		
Navicula								*				
Pinularia			*									
Cymbella			*									
Surirella			*				*			4		
Pleurosigma			*									
Gomphonema			*									
Nitzschia		*	*						2	5		
Melosira		5	*									
Stephanodiscus			*									
CYANOPHYCEÆ—												
Anabæna	1											
DESMIDACEÆ—												
Staurastrum	*											
Closterium	*										*	*
OTHER ALGÆ—												
Protococcus	20											
Pediastrum	*											
Spirogyra									*	*		
ANIMALS—												
Difflugia		*	*							3		
Anuræa												*
Peridineum							*	*		*		
Tillina												*
Euglena			*							*		
Sponge spicules									*			

SUMMARY.

	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July
Diatomaceæ		5	*	*			*	*	5	14		
Cyanophyceæ	1											
Desmidaceæ	*										*	*
Other algæ	20								*	*		
Protozoa		*	*				*	*	*	3		*

REMARKS FOR THE YEAR ENDING JULY, 1890.

August—Very little debris.
September—Moderate amount of debris.
October—Large quantities of debris and sediment.
November—Considerable inorganic sediment, vegetable fibre and debris.
December—Moderate quantities decaying matter.
January—Numerous fragments of higher plants.
February—Numerous fragments of higher plants; considerable sediment and debris.
March—Numerous fragments and debris.
April—Numerous fragments of higher plants and much sediment.
May—Considerable debris.
June—Considerable debris.
July—Considerable debris.

BACTERIOLOGICAL EXAMINATION, 1889-90.

	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July
Average No. bacteria per c. c..	107	144	135	1332	429	530	292	142	410	287	938	91
Temperature water at time of collection ° F..	70	----	----	46	46	42	40	38	50	58	65	66

REMARKS.—The most abundant and frequent form of bacteria was a white liquefying form. White solid, fluorescent, green liquefying and pink solid colonies were seen at times. No records of temperature or rainfall were obtainable.

TABLES OF AVERAGES.

Average Chemical Results for all the Reservoirs.

Figures indicate milligrams per liter, or parts per million. Water filtered through paper.

Date.	Residue on Evaporation. Total at 100° C.	Loss on Ignition.	Fixed.	Chlorine.	Nitrogen. Of Free Ammonia.	Of Albuminoid Ammonia.	Of Nitrites.	Of Nitrates.
August	50.6	14.5	36 1	1.98	0.026	0.200	0.0002	0.02
September	54.4	13.9	40.5	2.19	.038	.208	.0002	.03
October	49.9	10.6	39.3	2.26	.031	.176	.0014	.06
November	48.1	10.5	37.6	2.19	.027	.149	.0022	.06
December	44.3	8.7	35.6	2.21	.024	.143	.0008	.09
January	41.7	8.0	33.7	2.14	.042	.135	.0016	.13
February	37.6	7.0	30.6	2.08	.035	.124	.0015	.09
March	37.7	6.6	31.1	2.05	.030	.120	.0006	.08
April	35.6	6.9	28.7	2.19	.016	.122	.0007	.09
May	39.6	8.1	31.5	1.96	.025	139	.0001	.05
June	43.1	8.9	34.2	1.95	.049	.171	.0003	.03
July	45.8	8.3	37.5	2.12	.027	.181	.0011	.03
Average	44.0	9.4	34.6	2.11	.031	.154	.0009	.06

Average Number of Organisms per one Cubic Centimeter of all the Analyses.

	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July
Diatomaceæ	77.3	65.5	116.	124.	72.	49.6	25 3	101.	106.	161.	75.1	220.
Cyanophyceæ	33.6	62.	9.9	2.3	.6	....	....	.5	.4	2.9	4.	15.
Desmidaceæ	5.8	3.6	.9	3.5	1.2	.8	.3	.1	.1	1.1	1.2	12.
Protococcaceæ	61.1	56.6	29.3	21.	6.5	10.	5.	9.3	7.5	33.5	68.8	42.
Rhizopoda	.1	.3	.9	2.	.7	.3	....	.5	.4	.4	.3	1.1
Rotifera	.1	.2	.1	.1	.1	.2	.2	.3	.7	.8	1.5	....
Infusoria	12.	5.9	5.9	123.	71.	49.	108.	57.	40.	8.2	32.5	26.
Totals	190.0	194.1	163 0	275.9	152.1	109.4	138.8	168.7	155.1	207.9	183.4	316.1

Average Number of Bacteria per Cubic Centimeter in all the Reservoirs.

	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July
1889–90	186	738	1404	1014	1802	806	684	339	464	452	538	225
1890–91	163	500	910	187	338	181	187	177	137	178	402	....

THE CHARTS.

The monthly variations in some of the various items of the analyses are shown by curves for each reservoir in the following charts. Those relating to the chemical analyses show the monthly variation in total solids, in nitrogen of albuminoid ammonia, in chlorine, and in nitrogen of nitrates. In some cases there is also given the amount of rainfall between the dates when the samples were collected. The variations in the number of bacteria are shown in the second set of charts, together with the water temperature at the time the samples were taken, and the air temperature and rainfall for the month previous to the date of collection, wherever such data are available.

For convenience of comparison the chemical and bacteriological charts are grouped separately, but the order followed in each set is the same, and is as follows:

HARTFORD,	WILLIMANTIC,
NEW BRITAIN,	NORWICH,
MERIDEN,	THOMASTON,
MIDDLETOWN,	WATERBURY,
NEW HAVEN—	BRIDGEPORT,
Lake Whitney,	ROCKVILLE,
Lake Saltonstall,	DANBURY,
Wintergreen Lake.	STAMFORD.

Shuttle Lake, New Britain. 1889–90.

Residue on Evaporation, Parts per Million.

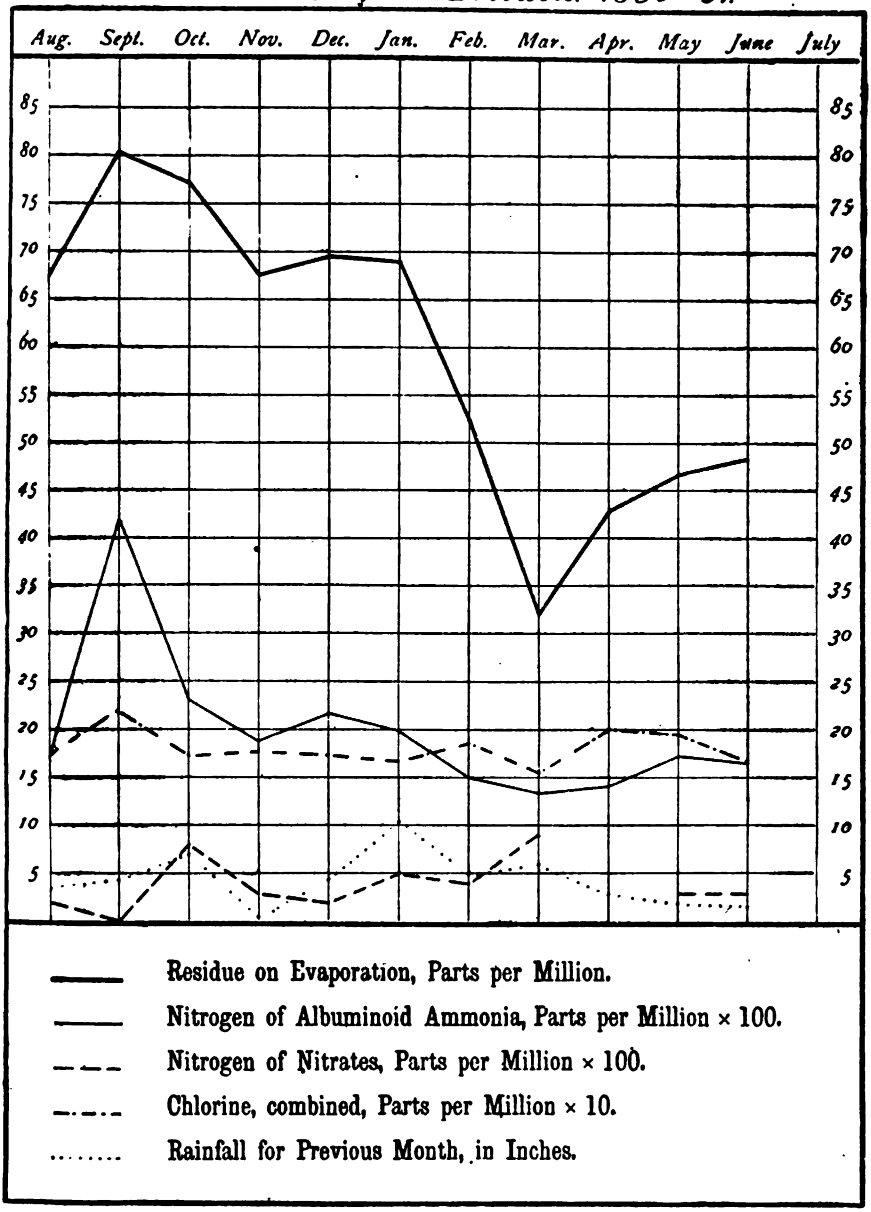
Nitrogen of Albuminoid Ammonia, Parts per Million × 100.

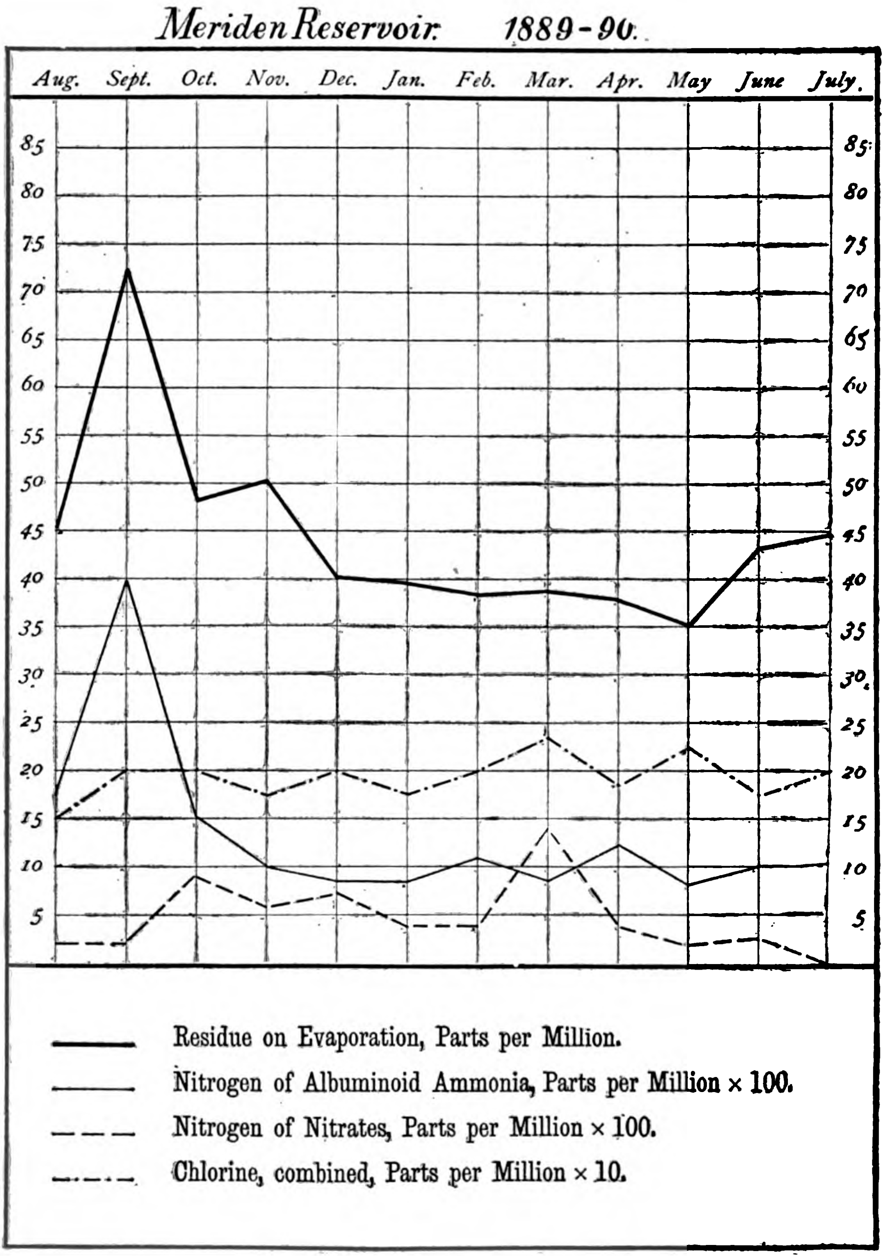
Nitrogen of Nitrates, Parts per Million × 100.

Chlorine, combined, Parts per Million × 10.

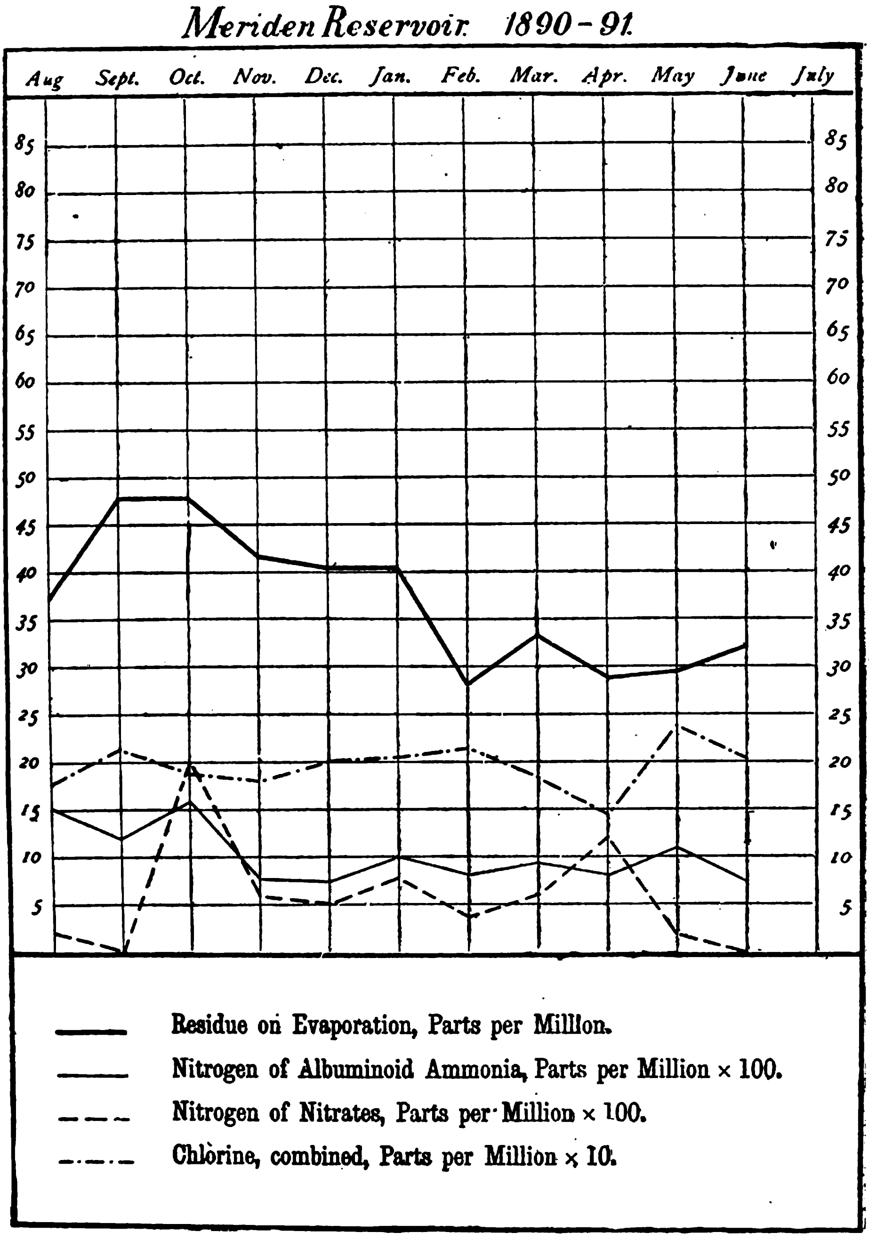
Rainfall for Previous Month, in Inches.

Shuttle Lake, New Britain. 1890-91.

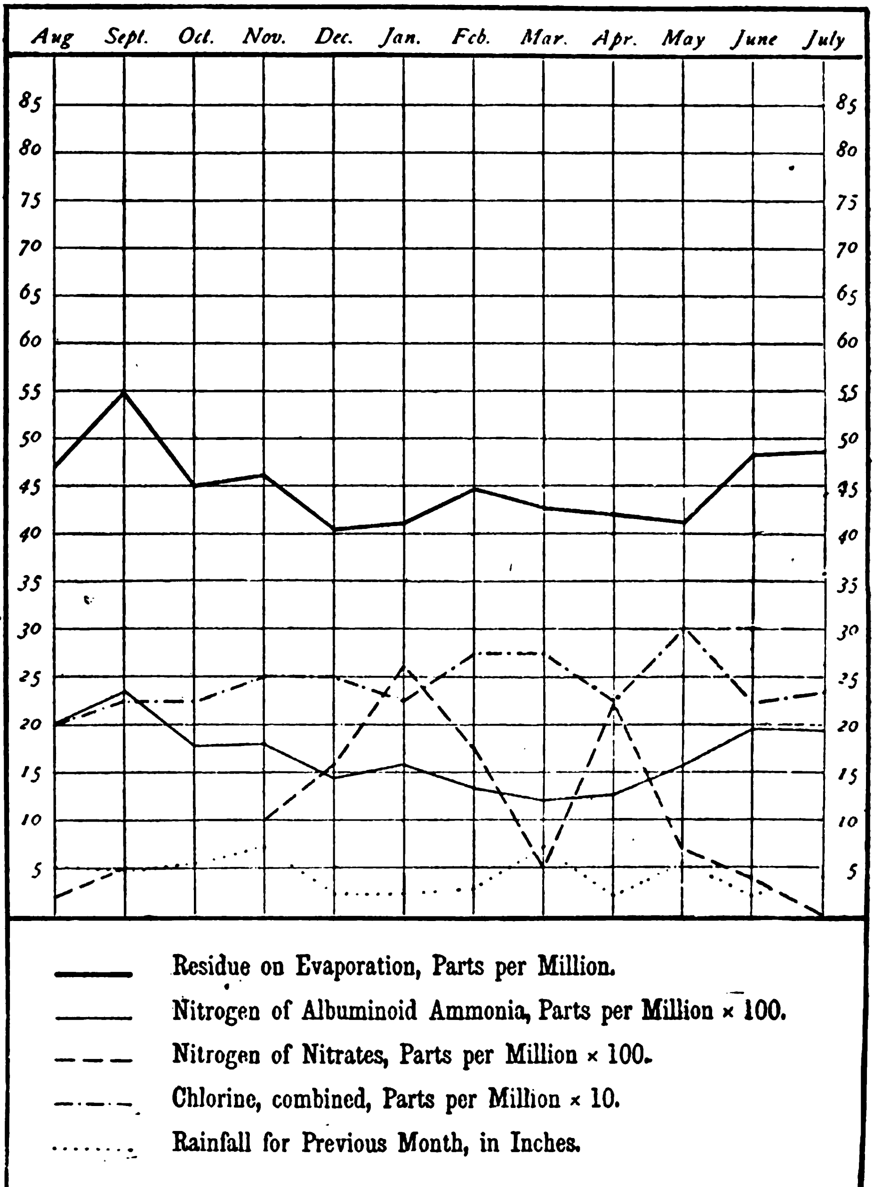




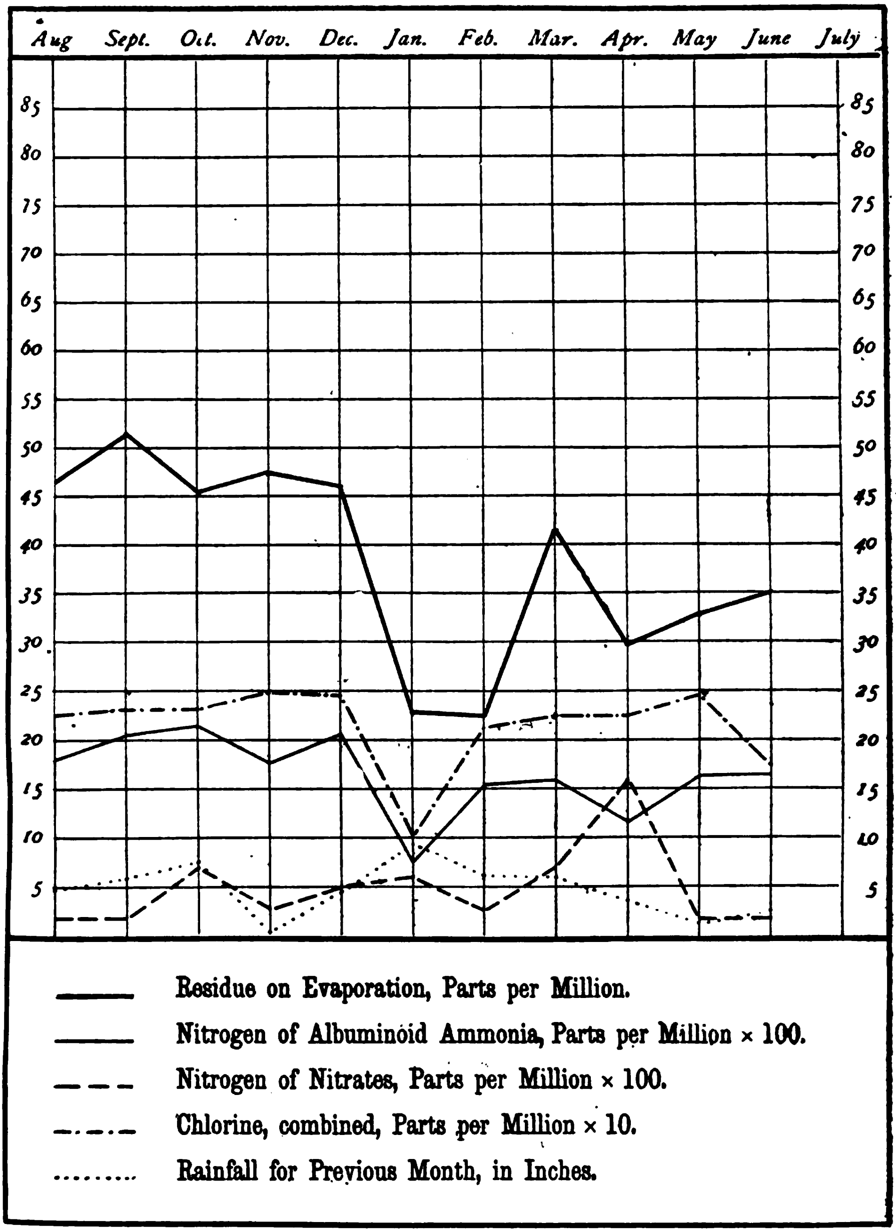
Meriden Reservoir. 1889-90.
Aug. Sept. Oct. Nov. Dec. Jan. Feb. Mar. Apr. May June July.
85 80 75 70 65 60 55 50 45 40 35 30 25 20 15 10 5
Residue on Evaporation, Parts per Million.
Nitrogen of Albuminoid Ammonia, Parts per Million × 100.
Nitrogen of Nitrates, Parts per Million × 100.
Chlorine, combined, Parts per Million × 10.

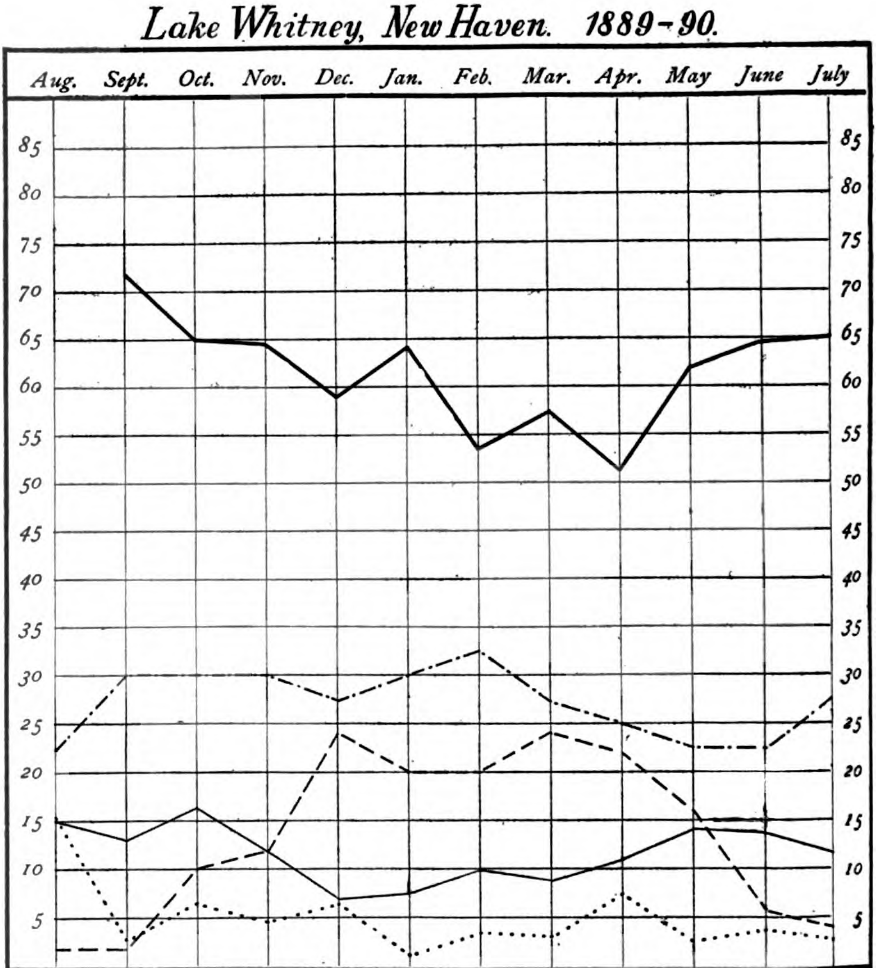

Meriden Reservoir 1890-91.
Aug Sept. Oct. Nov. Dec. Jan. Feb. Mar. Apr. May June July
85 80 75 70 65 60 55 50 45 40 35 30 25 20 15 10 5
Residue on Evaporation, Parts per Million.
Nitrogen of Albuminoid Ammonia, Parts per Million × 100.
Nitrogen of Nitrates, Parts per Million × 100.
Chlorine, combined, Parts per Million × 10.

Middletown Reservoir. 1889-90.



Middletown Reservoir. 1890–91.





Residue on Evaporation, Parts per Million.

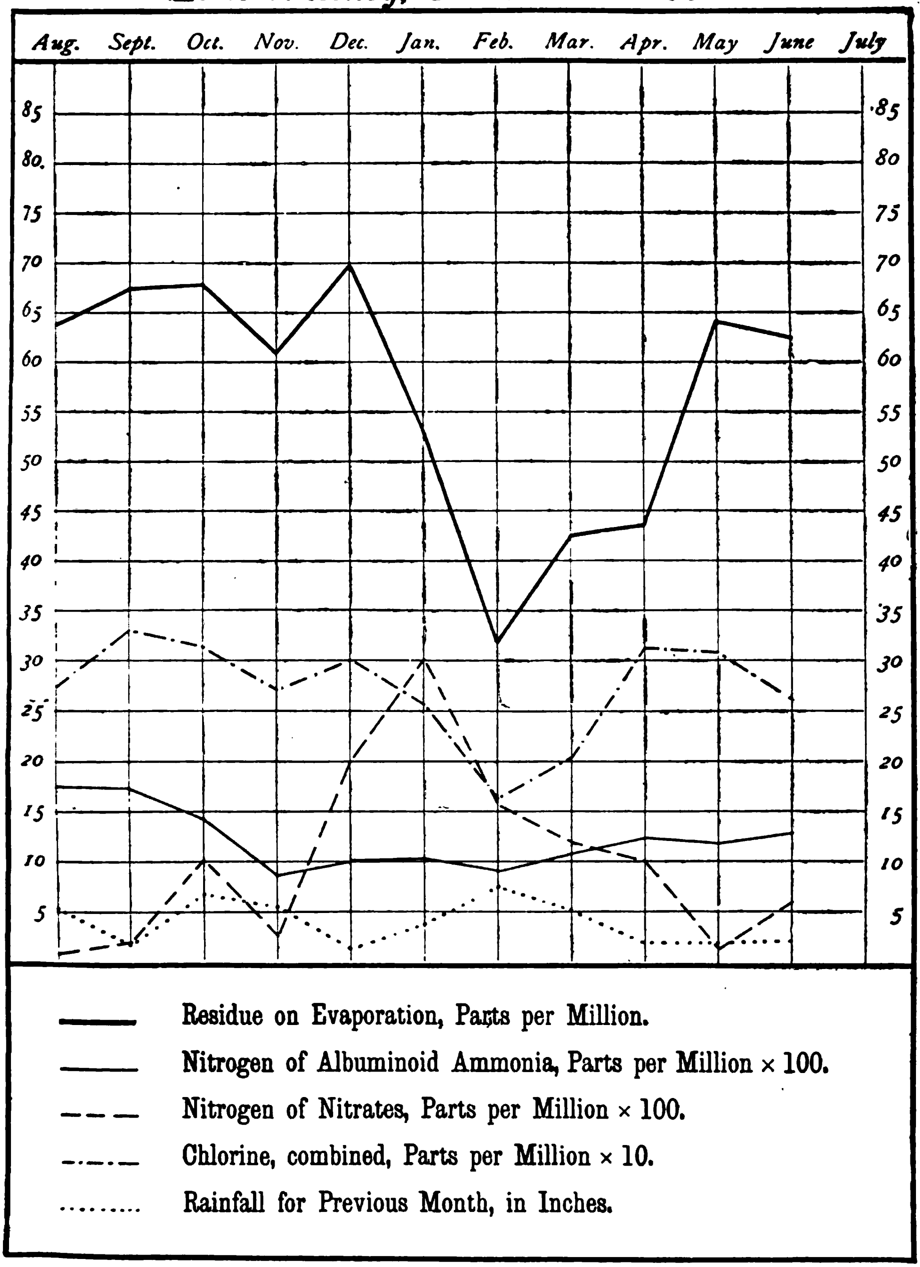
Nitrogen of Albuminoid Ammonia, Parts per Million × 100.

Nitrogen of Nitrates, Parts per Million × 100.

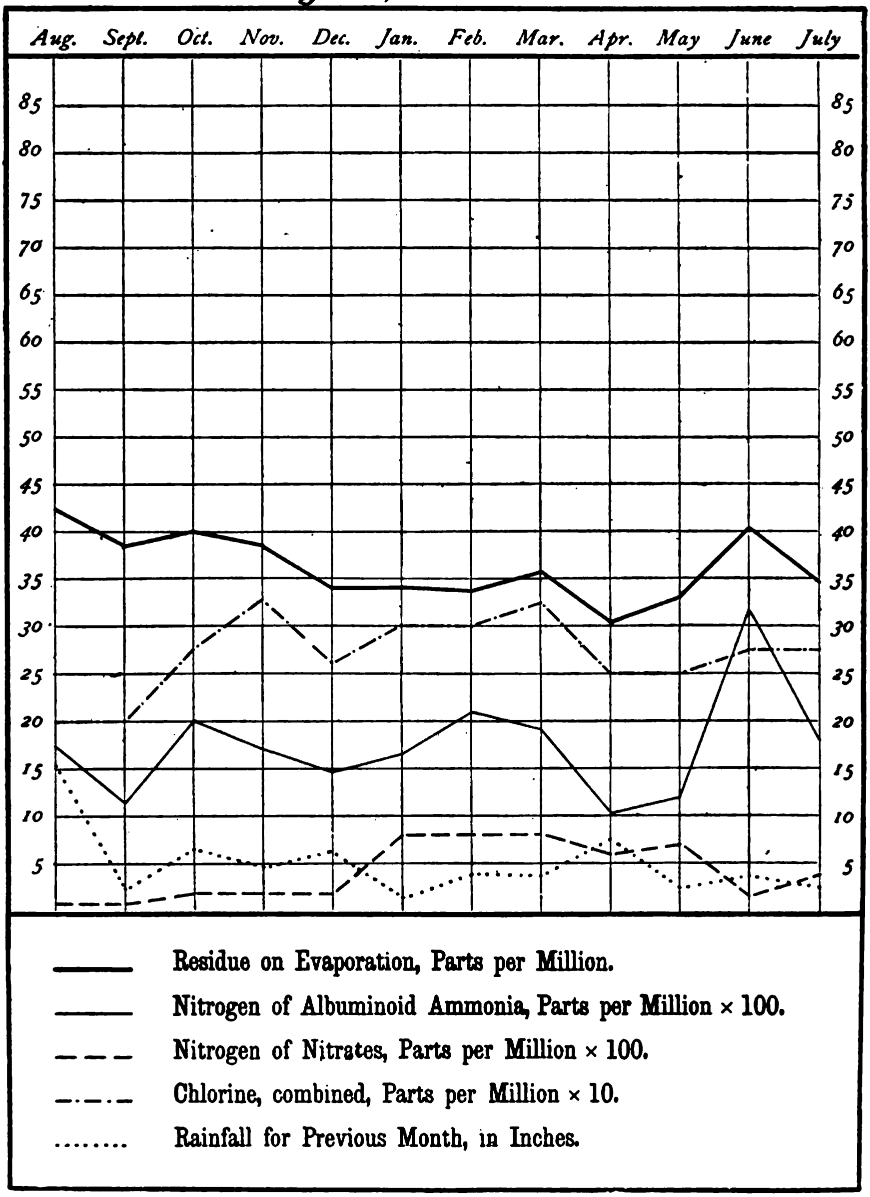
Chlorine, combined, Parts per Million × 10.

Rainfall for Previous Month, in Inches.

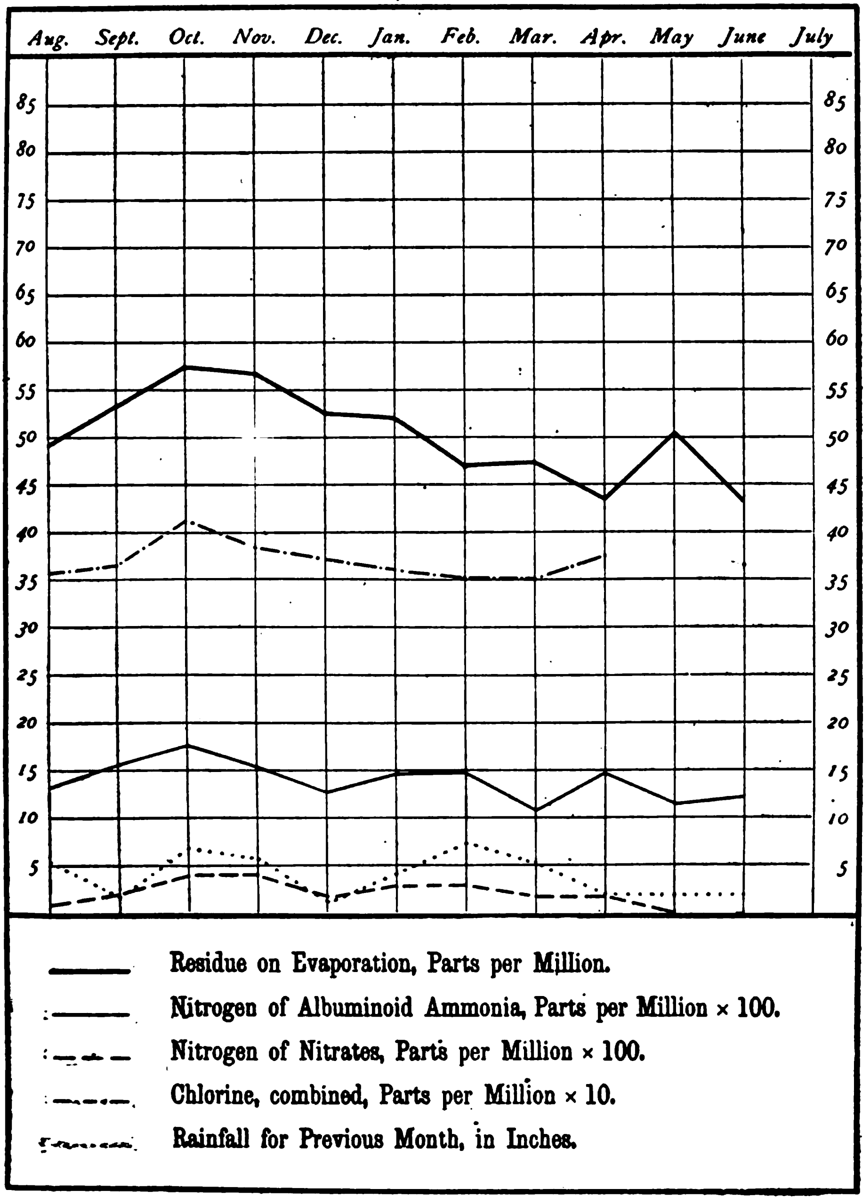
Lake Whitney, New Haven. 1890–91.



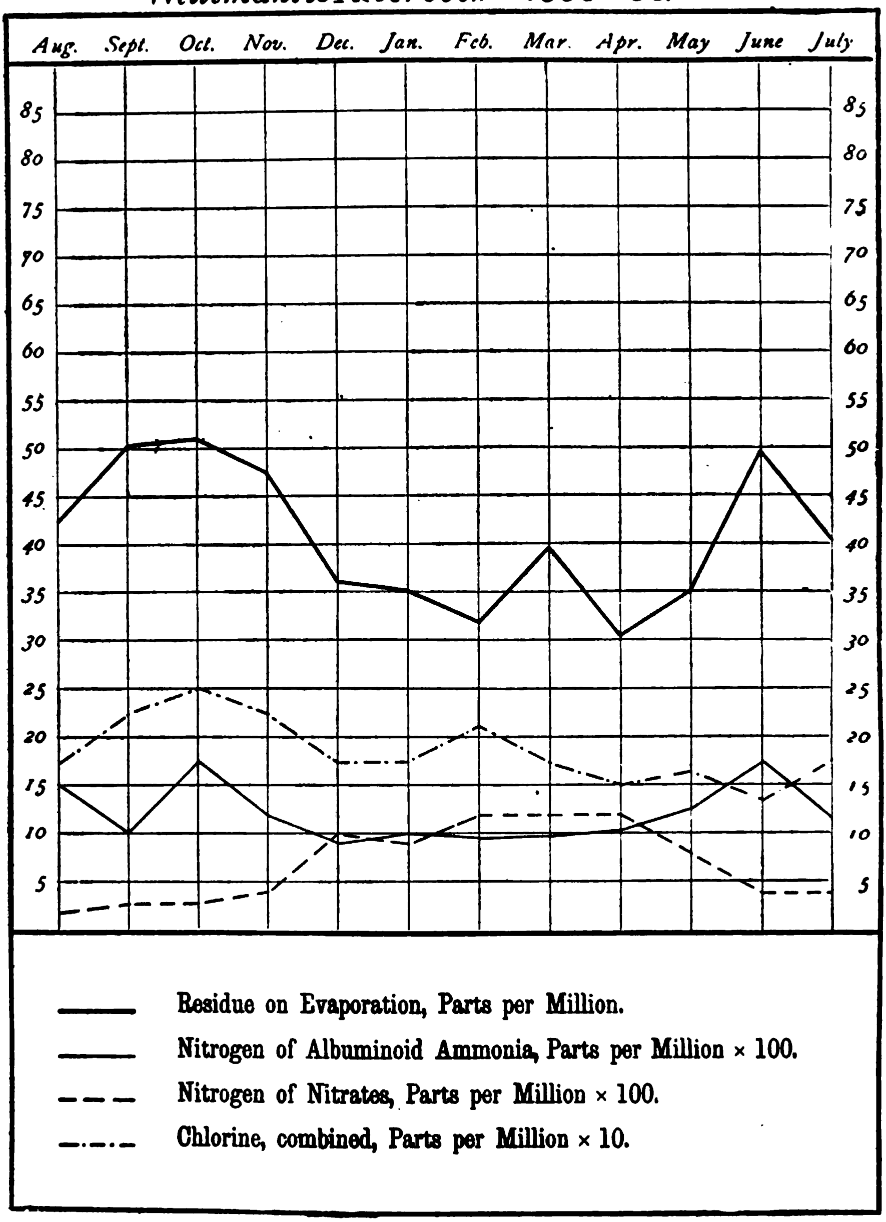
Lake Wintergreen, New Haven. 1889-90.



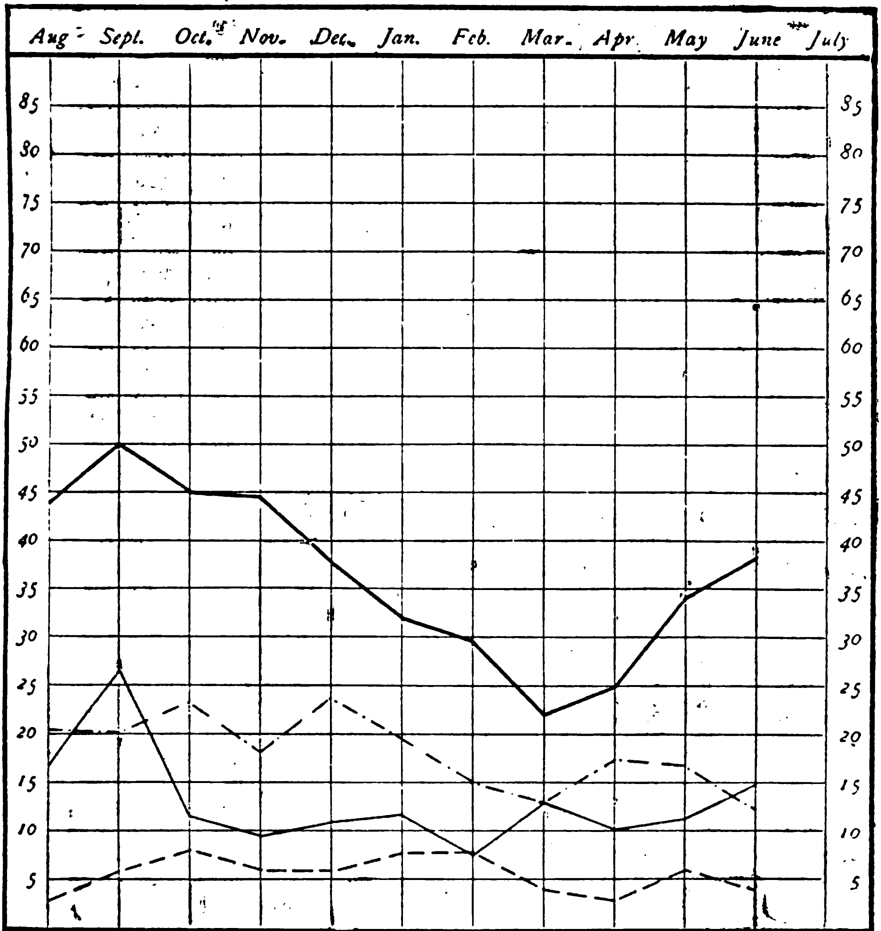
Lake Saltonstall, New Haven. 1890-91.



Willimantic Reservoir 1889-90.



Willimantic Reservoir 1890-91.



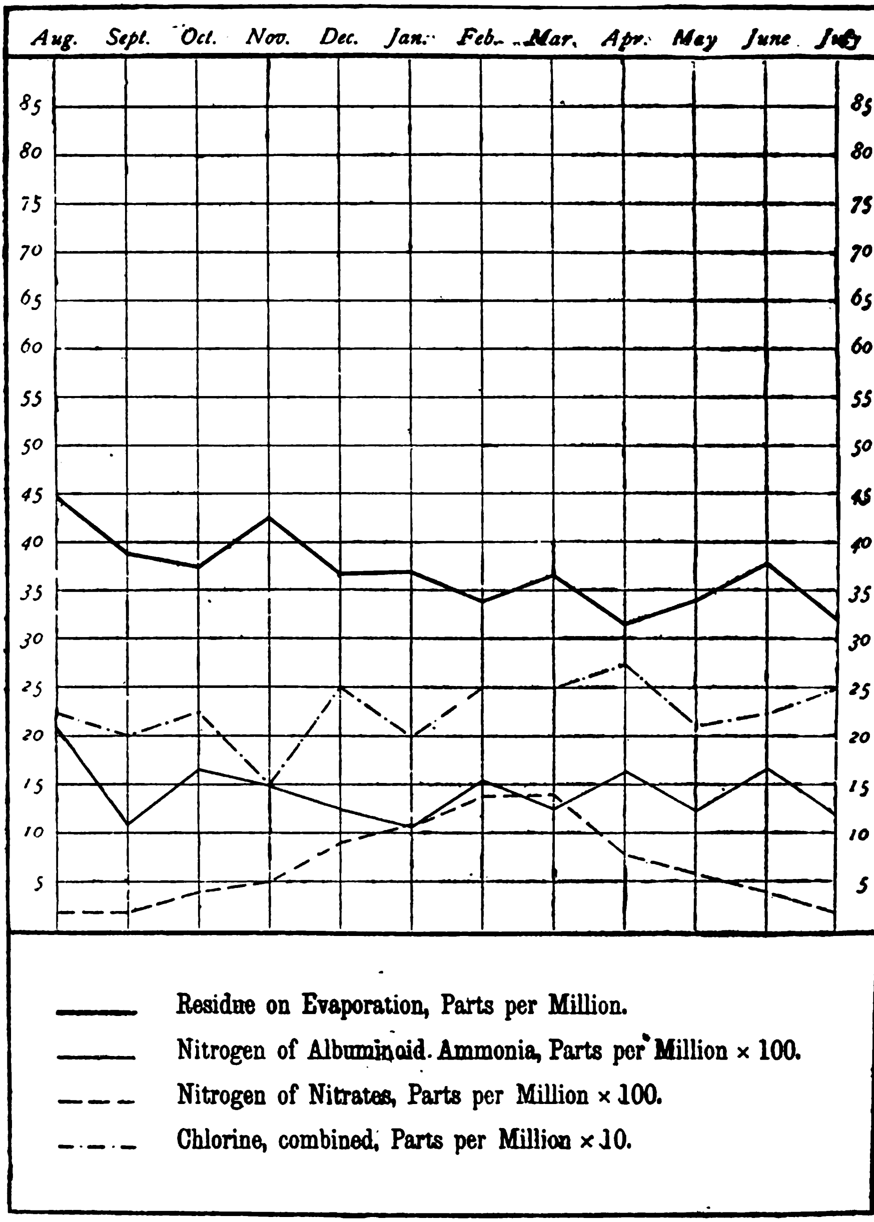
Residue on Evaporation, Parts per Million.

Nitrogen of Albuminoid Ammonia, Parts per Million × 100.

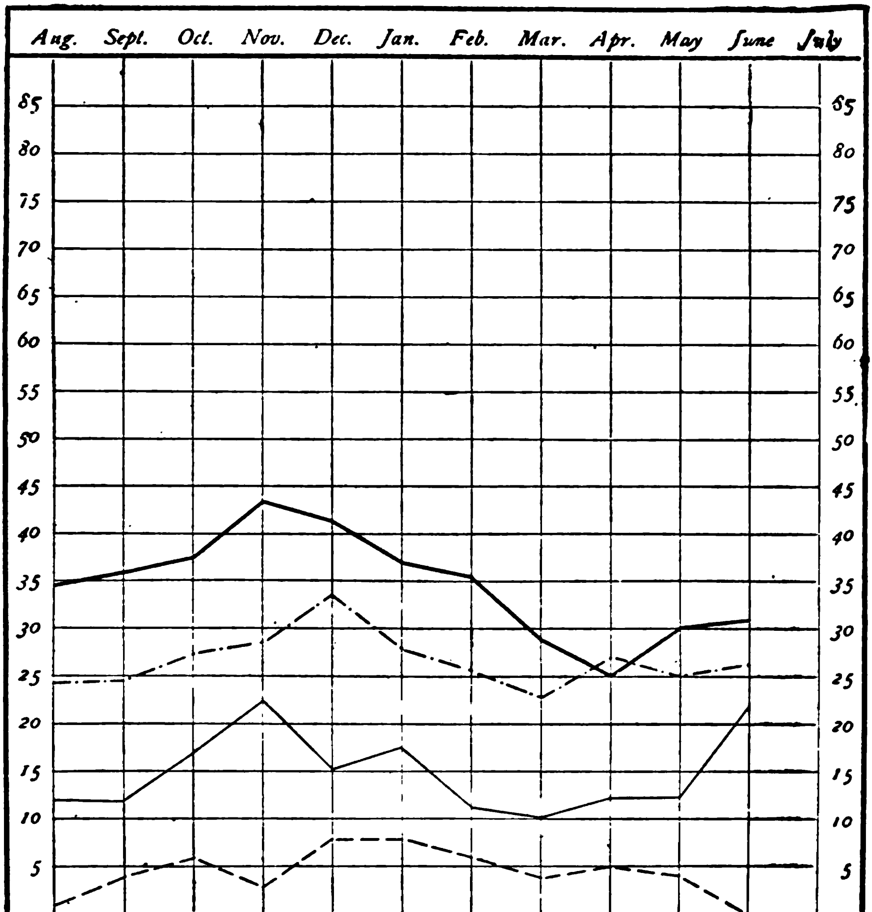
Nitrogen of Nitrates, Parts per Million × 100.

Chlorine, combined, Parts per Million × 10.

Norwich Reservoir 1889–90.



Norwich Reservoir 1890-91.

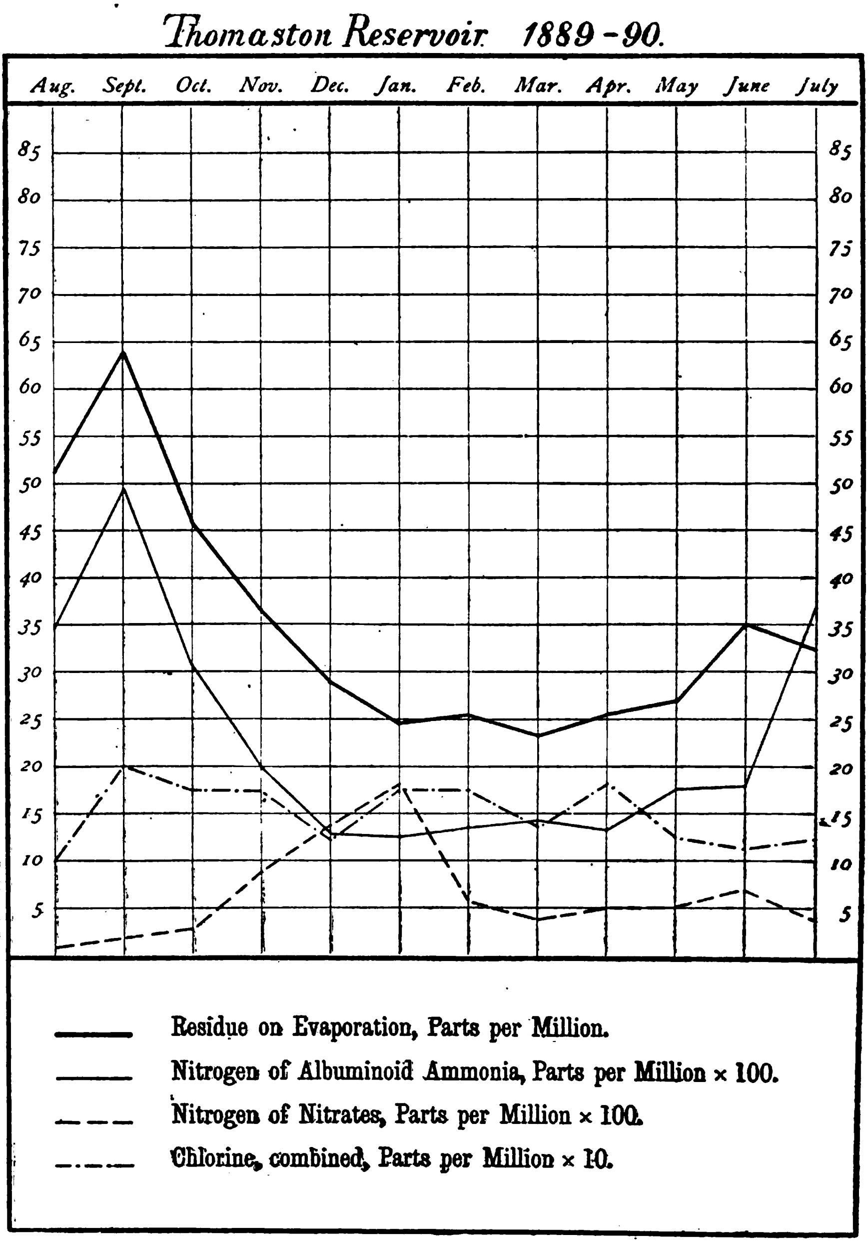


Residue on Evaporation, Parts per Million.

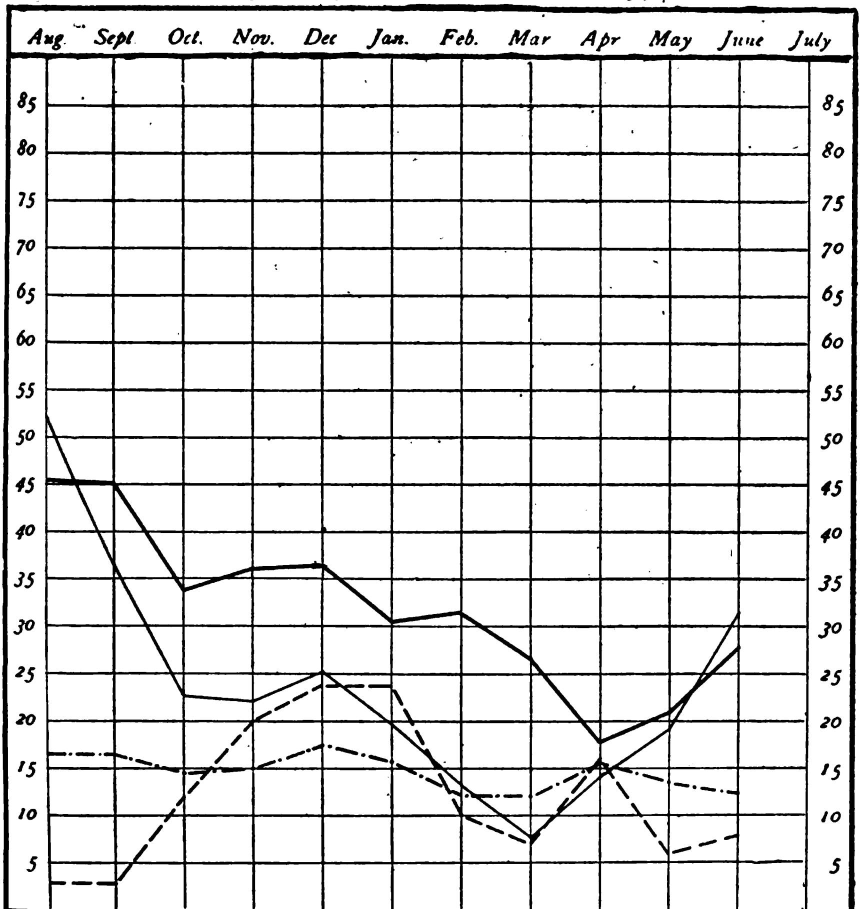
Nitrogen of Albuminoid Ammonia, Parts per Million × 100.

Nitrogen of Nitrates, Parts per Million × 100.

Chlorine, combined, Parts per Million × 10..


Thomaston Reservoir 1889-90.
Aug. Sept. Oct. Nov. Dec. Jan. Feb. Mar. Apr. May June July
85 80 75 70 65 60 55 50 45 40 35 30 25 20 15 10 5
Residue on Evaporation, Parts per Million.
Nitrogen of Albuminoid Ammonia, Parts per Million × 100.
Nitrogen of Nitrates, Parts per Million × 100.
Chlorine, combined, Parts per Million × 10.

Thomaston Reservoir 1890-91.



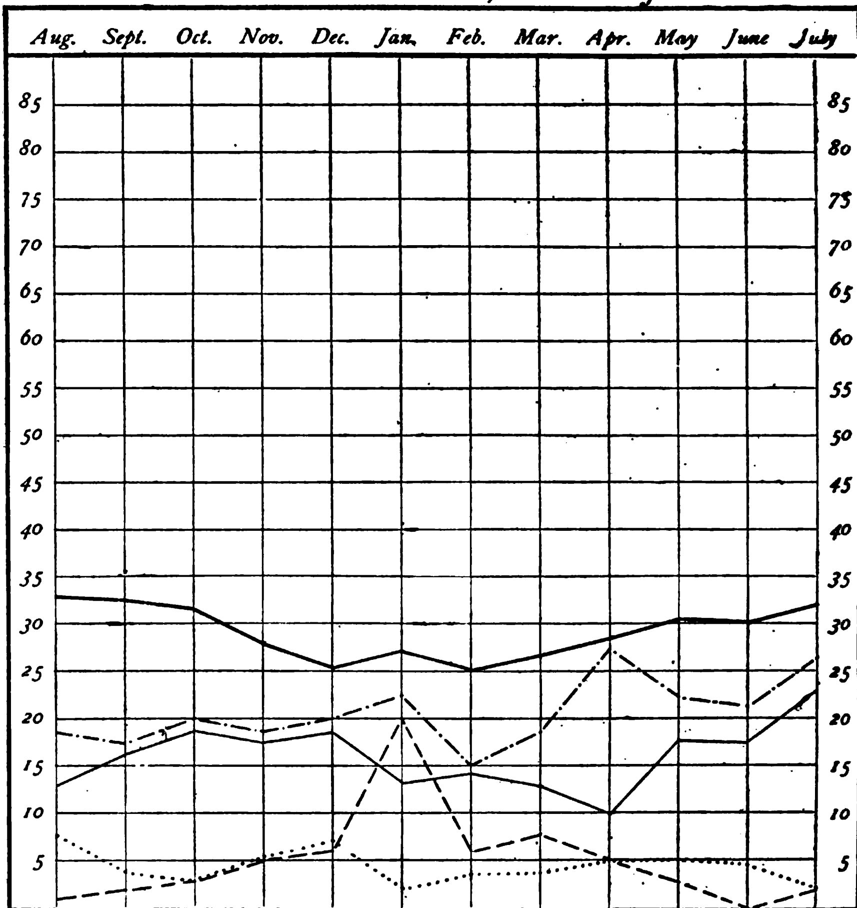
Residue on Evaporation, Parts per Million.

Nitrogen of Albuminoid Ammonia, Parts per Million. × 100.

Nitrogen of Nitrates, Parts per Million × 100.

Chlorine, combined, Parts per Million × 10.

East Mountain Reservoir, Waterbury. 1889–90.



Residue on Evaporation, Parts per Million.

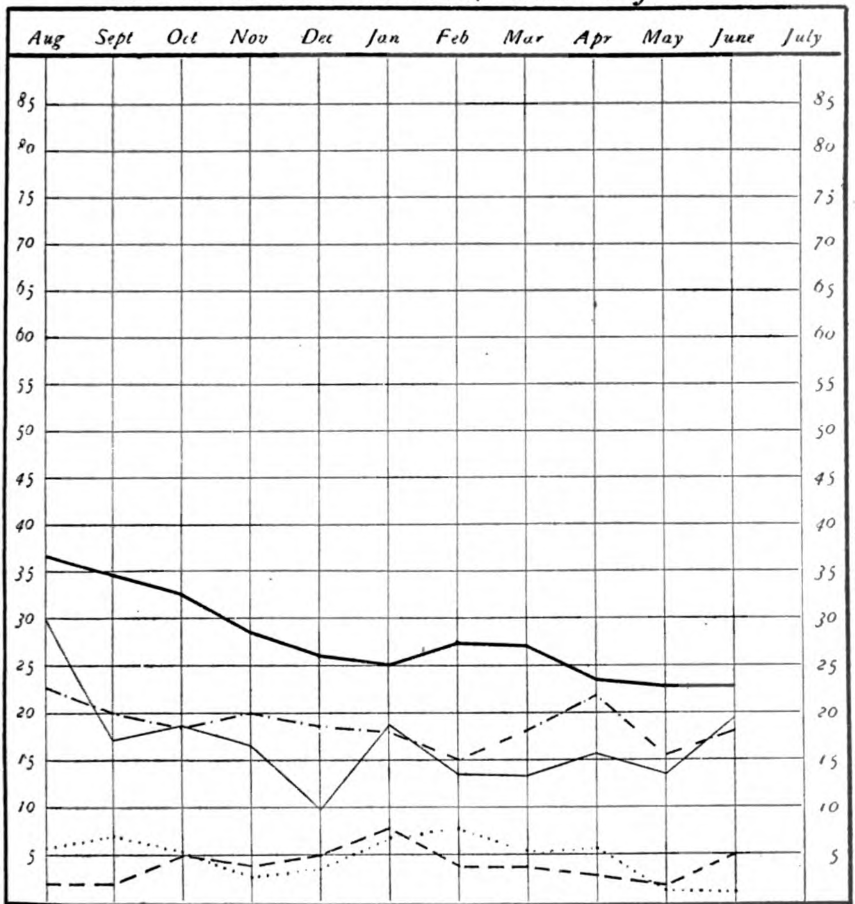
Nitrogen of Albuminoid Ammonia, Parts per Million × 100.

Nitrogen of Nitrates, Parts per Million × 100.

Chlorine, combined, Parts per Million × 10.

Rainfall for Previous Month, in Inches.

East Mountain Reservoir, Waterbury 1890-91



Residue on Evaporation, Parts per Million.

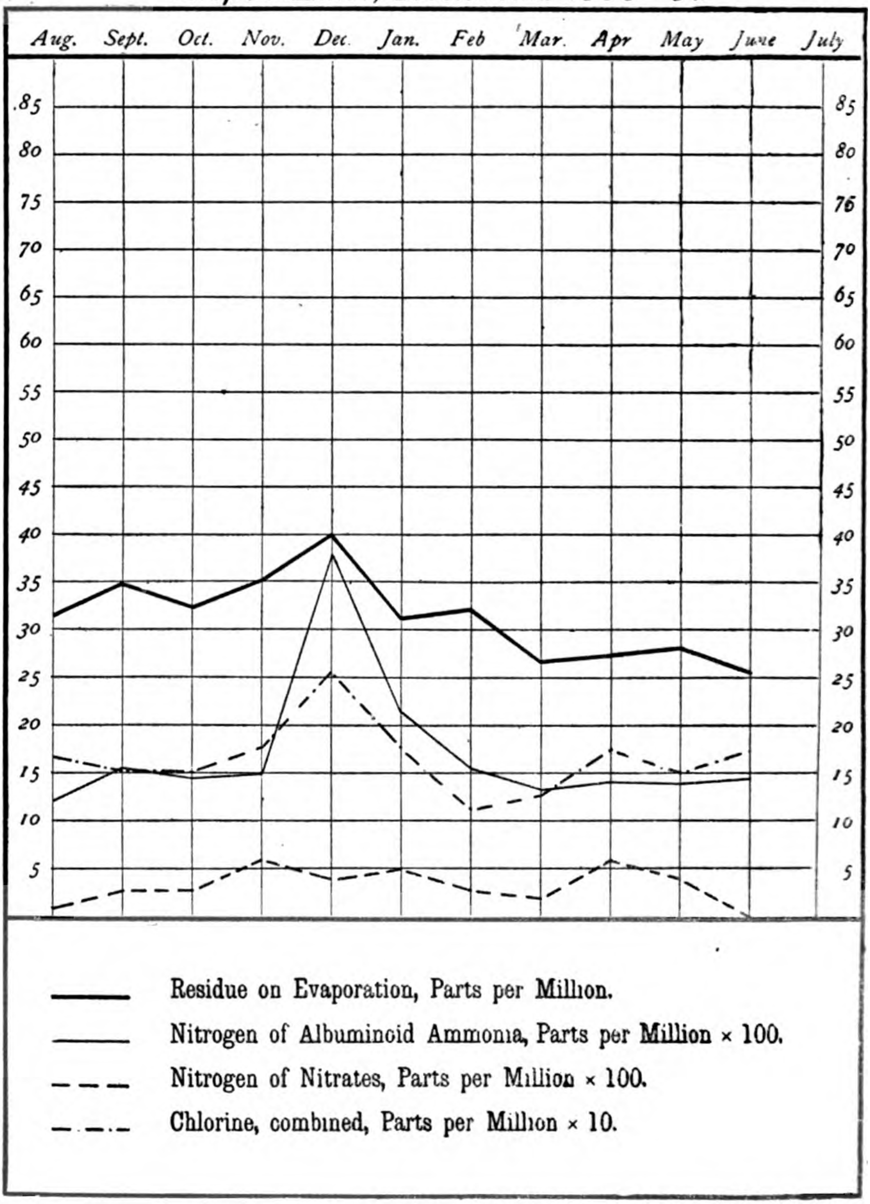
Nitrogen of Albuminoid Ammonia, Parts per Million × 100.

Nitrogen of Nitrates, Parts per Million × 100.

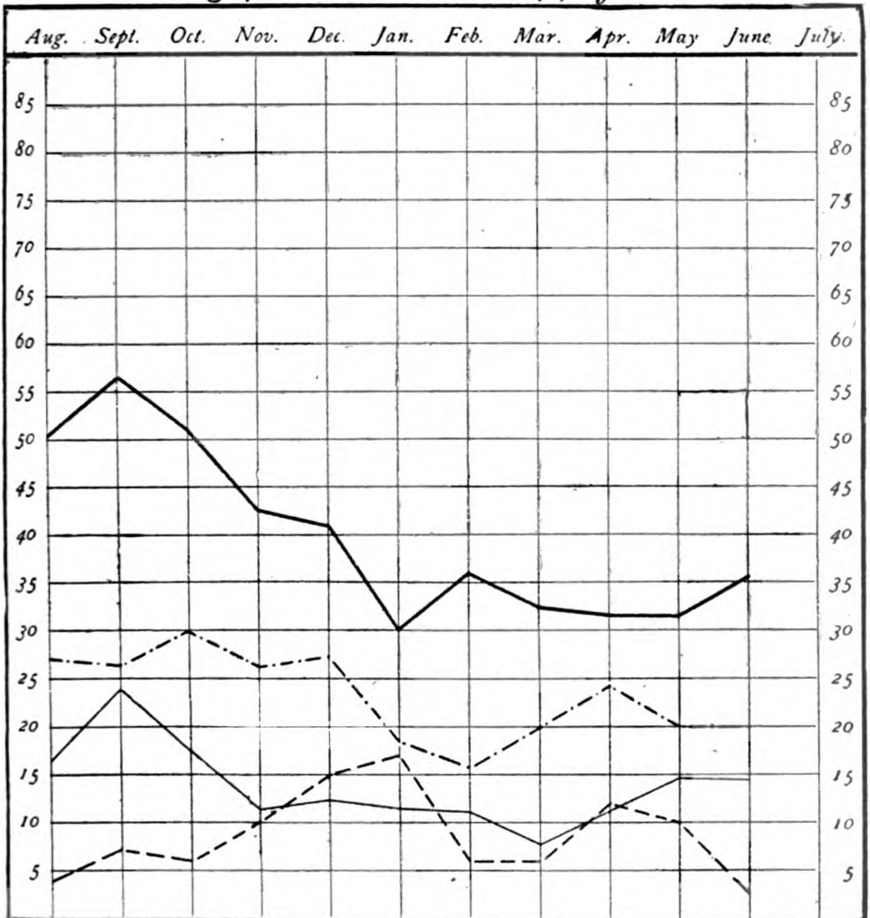
Chlorine, combined, Parts per Million × 10.

Rainfall for Previous Month, in Inches.

Snipsic Lake, Rockville. 1890–91.



Bridgeport Mill River Supply. 1890-91

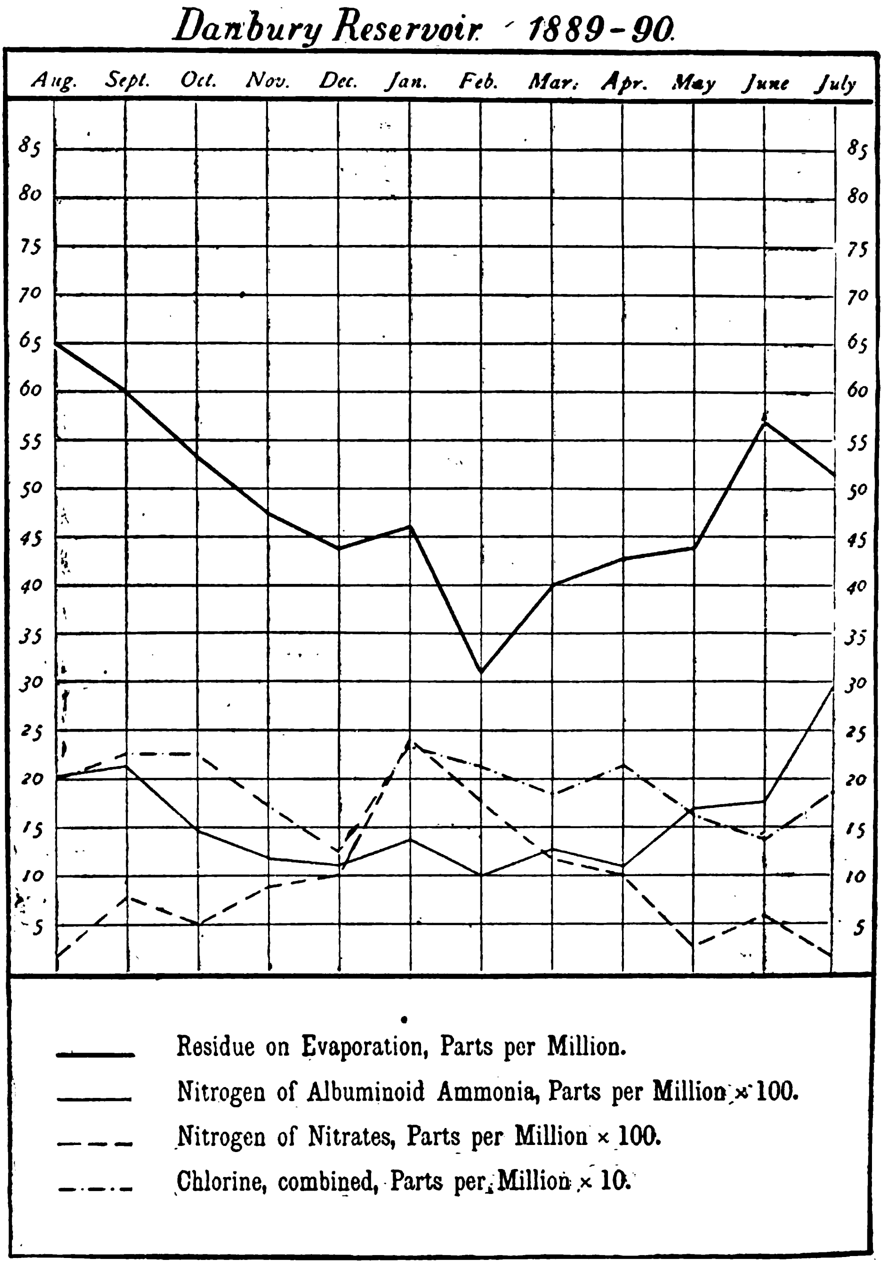


Residue on Evaporation, Parts per Million.

Nitrogen of Albuminoid Ammonia, Parts per Million × 100.

Nitrogen of Nitrates, Parts per Million × 100

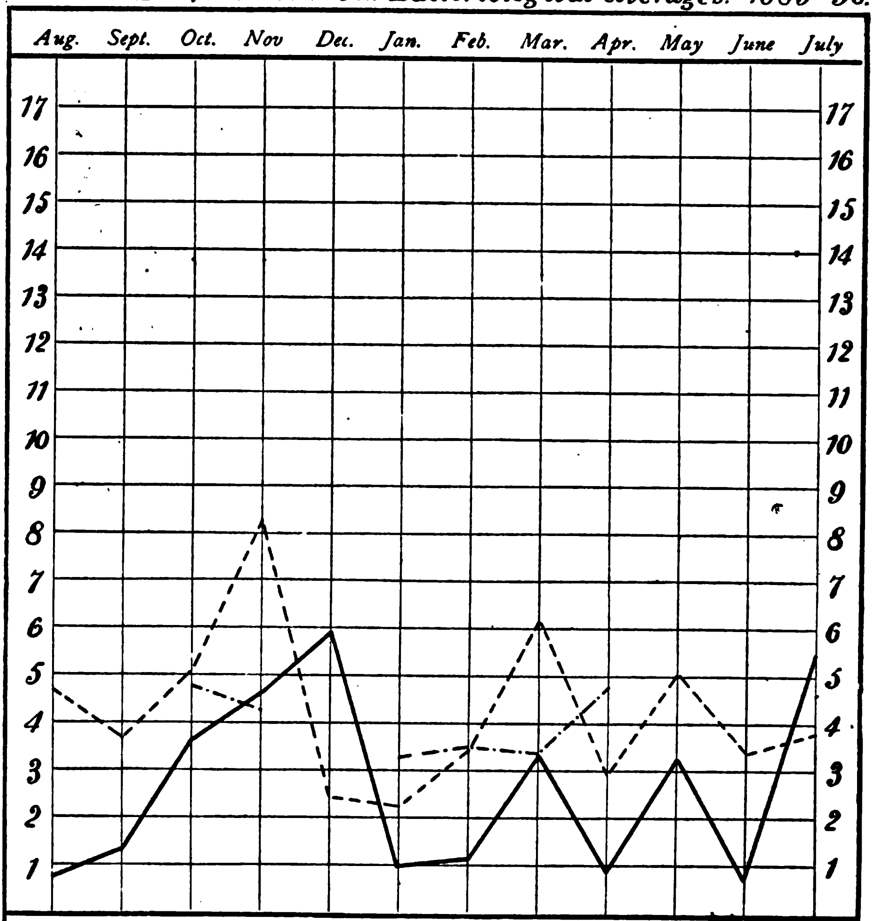
Chlorine, combined, Parts per Million × 10.


Danbury Reservoir 1889-90.
Aug. Sept. Oct. Nov. Dec. Jan. Feb. Mar. Apr. May June July
85 80 75 70 65 60 55 50 45 40 35 30 25 20 15 10 5
Residue on Evaporation, Parts per Million.
Nitrogen of Albuminoid Ammonia, Parts per Million × 100.
Nitrogen of Nitrates, Parts per Million × 100.
Chlorine, combined, Parts per Million × 10.

Stamford Reservoir 1889-90.

Residue on Evaporation, Parts per Million.
Nitrogen of Albuminoid Ammonia, Parts per Million × 100.
Nitrogen of Nitrates, Parts per Million × 100.
Chlorine, combined, Parts per Million × 10.

Hartford Reservoir. Bacteriological Averages. 1889-90.

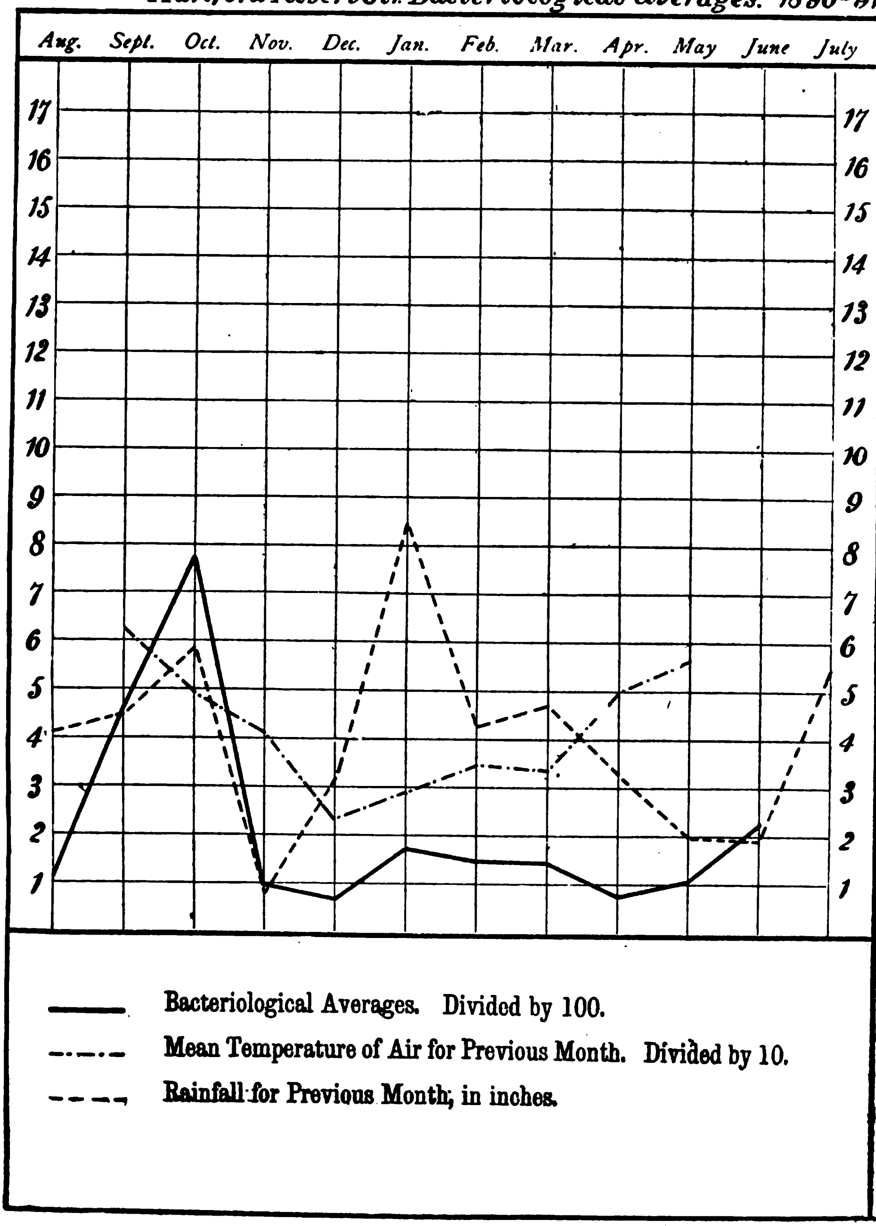


——— Bacteriological Averages. Divided by 100.

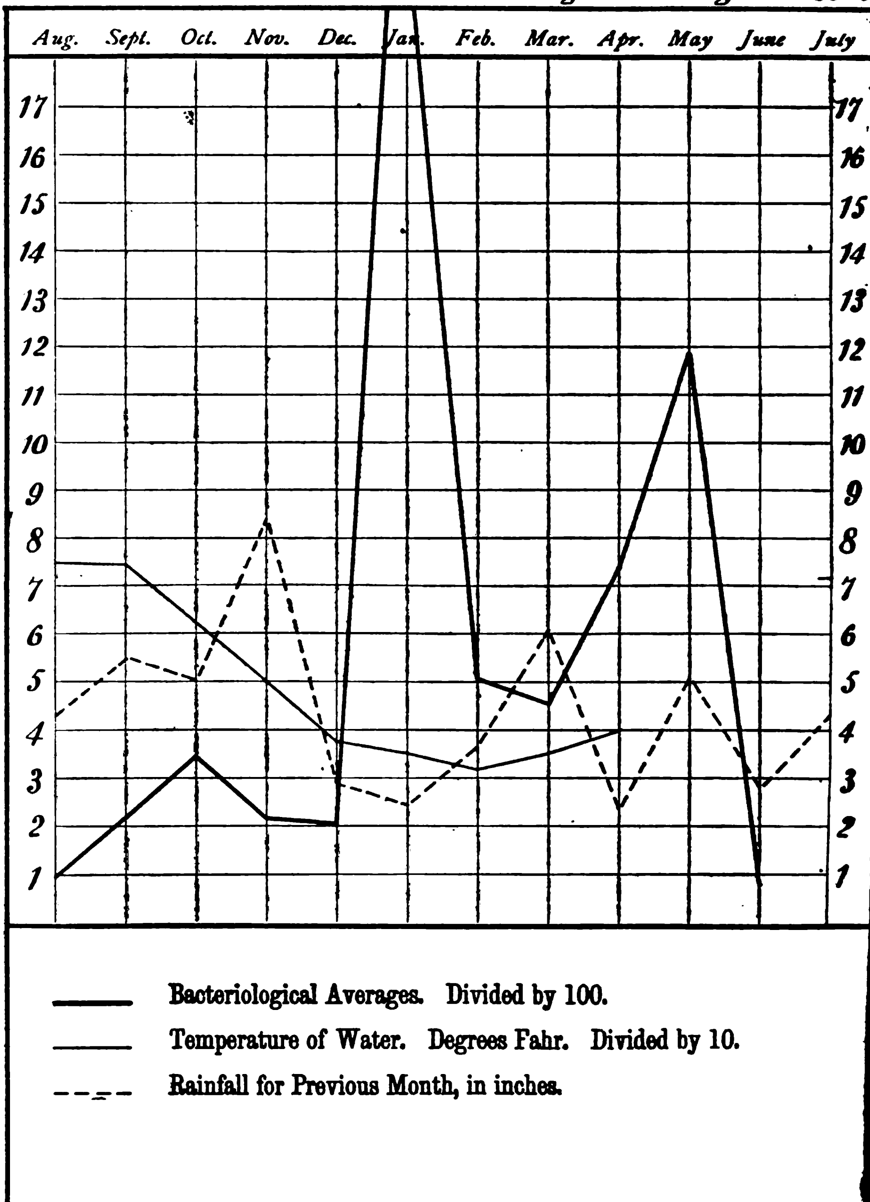
-·-·- Mean Temperature of Air for Previous Month. Divided by 10.

- - - - Rainfall for Previous Month, in inches.

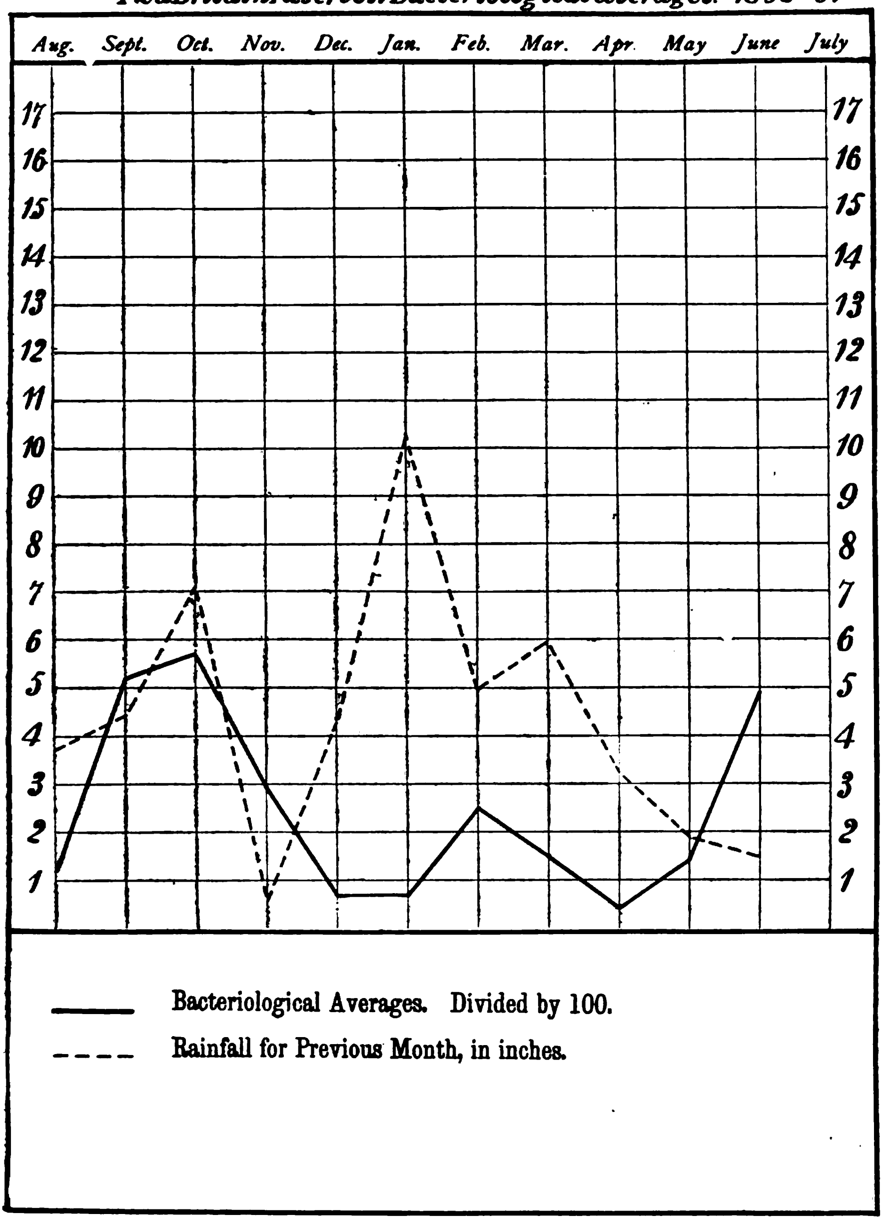
Hartford Reservoir Bacteriological Averages. 1890-91

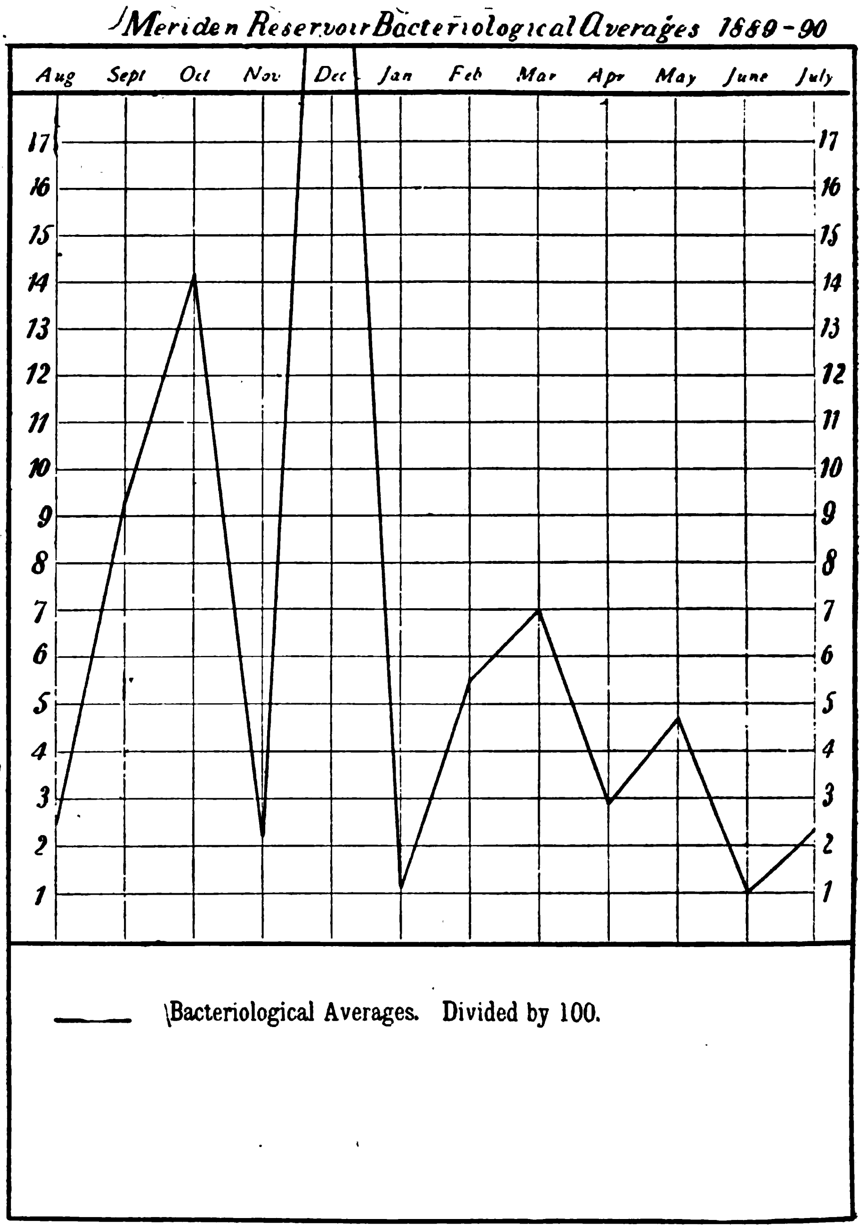


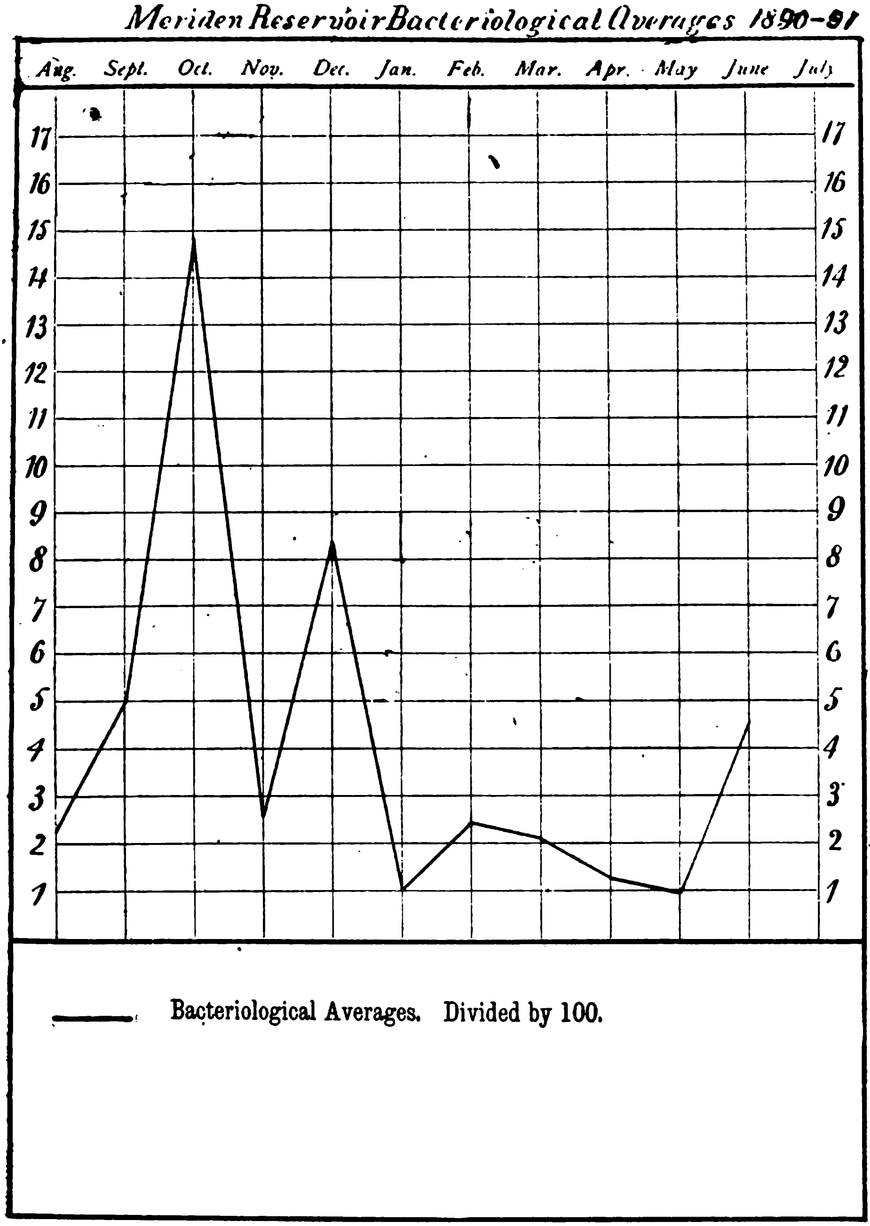
New Britain Reservoir. Bacteriological Averages. 1889-90.



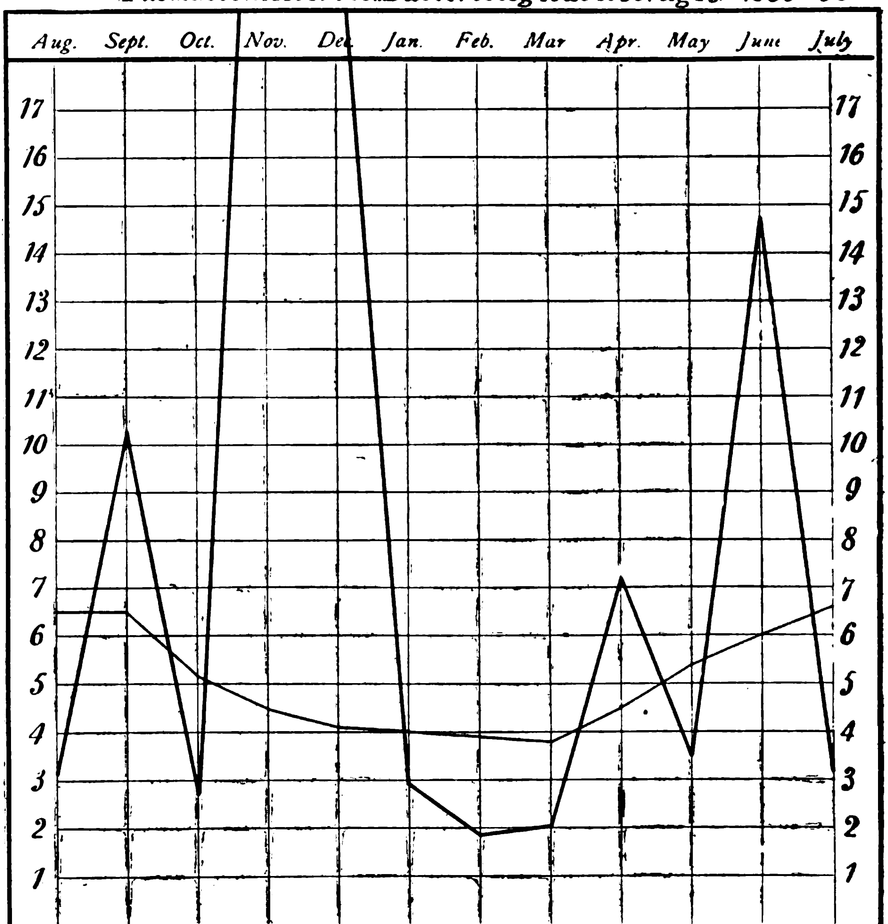
New Britain Reservoir Bacteriological Averages. 1890-91




Meriden Reservoir Bacteriological Averages 1889-90
Aug Sept Oct Nov Dec Jan Feb Mar Apr May June July
17 16 15 14 13 12 11 10 9 8 7 6 5 4 3 2 1
Bacteriological Averages. Divided by 100.


Meriden Reservoir Bacteriological Averages 1890-91
Aug. Sept. Oct. Nov. Dec. Jan. Feb. Mar. Apr. May June July
17 16 15 14 13 12 11 10 9 8 7 6 5 4 3 2 1
Bacteriological Averages. Divided by 100.

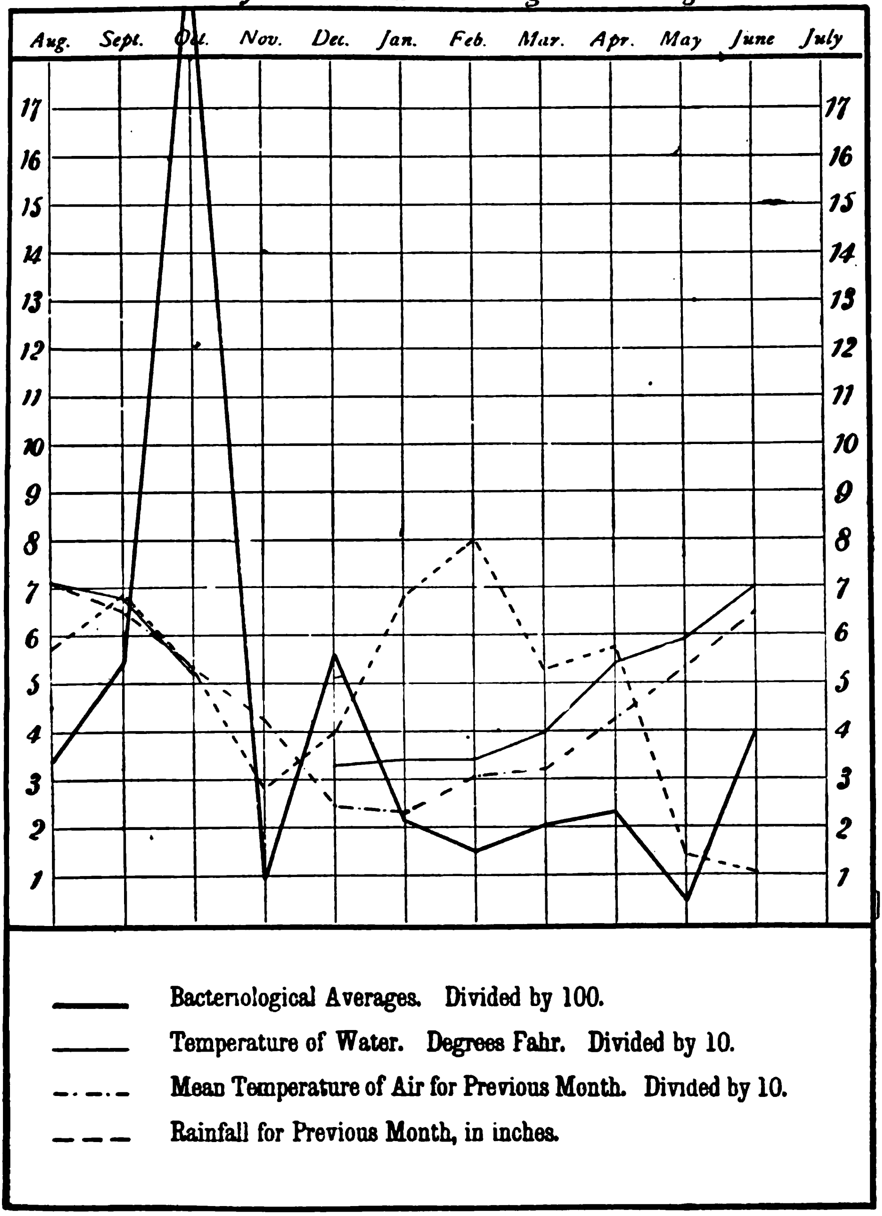
Thomaston Reservoir Bacteriological Averages. 1889-90



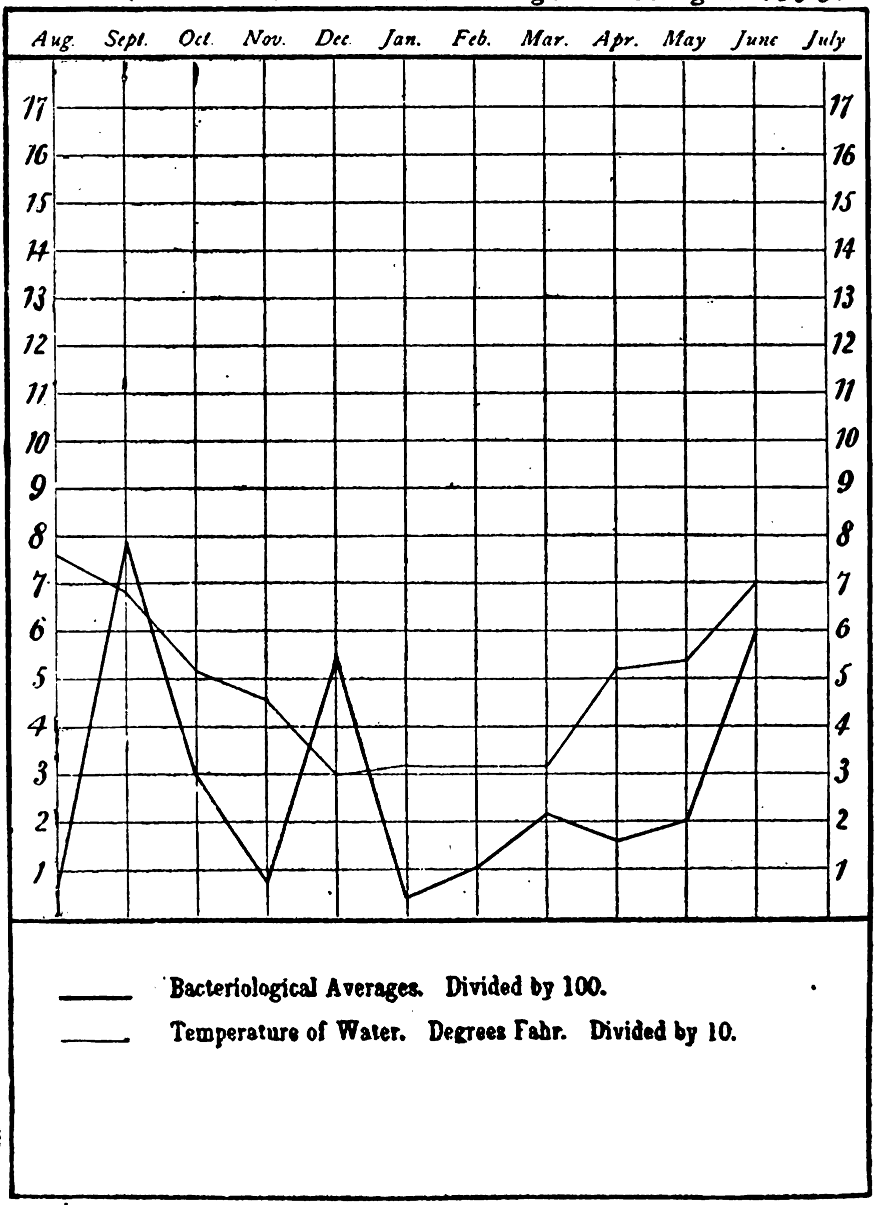
Bacteriological Averages. Divided by 100.

Temperature of Water. Degrees Fahr. Divided by 10.

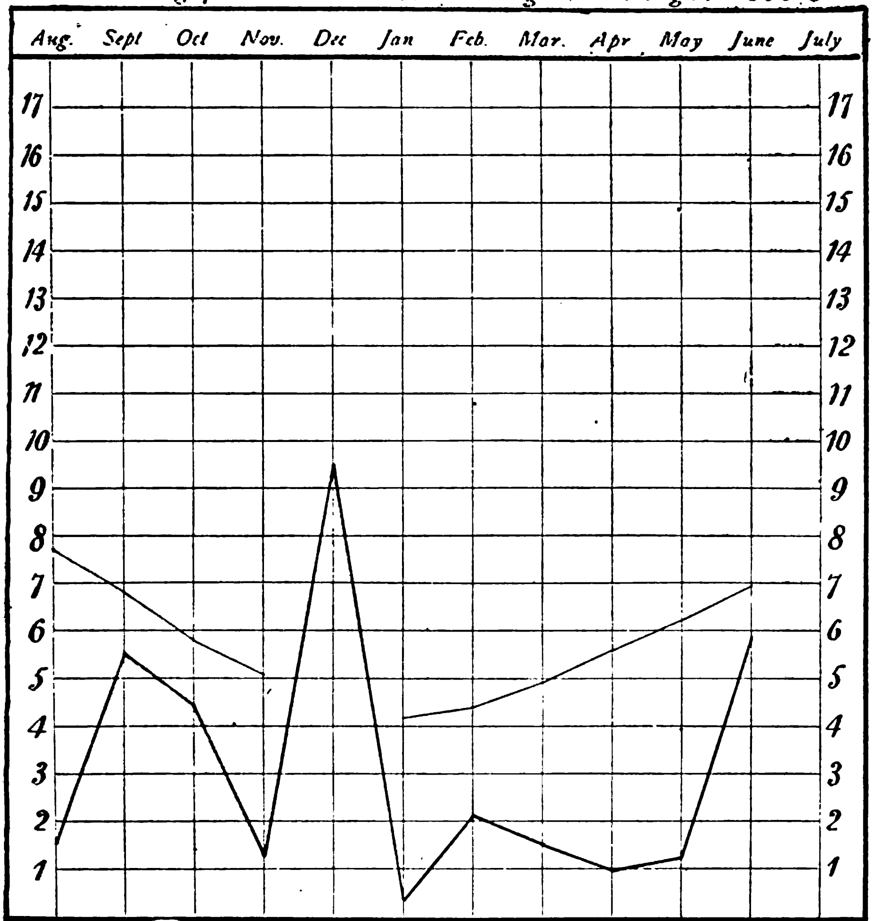
Waterbury Reservoir. Bacteriological Averages. 1890-91.



Rockville Reservoir Bacteriological Averages 1890-91



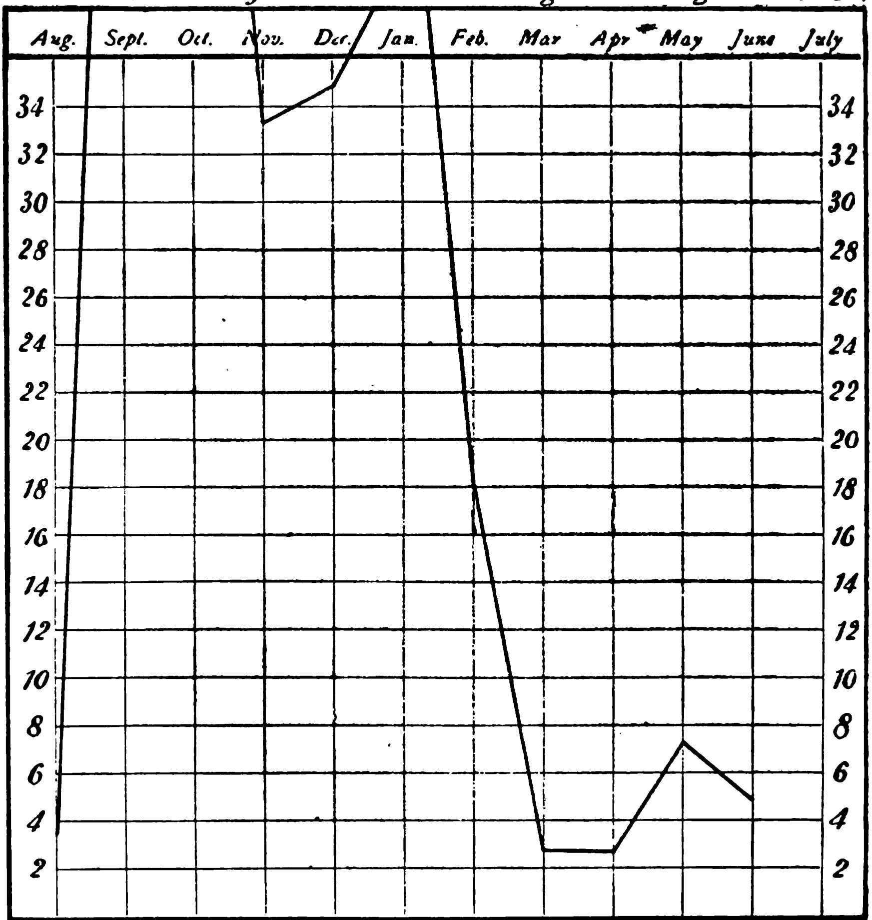
Bridgeport Reservoir Bacteriological Averages 1890-91



Bacteriological Averages. Divided by 100.

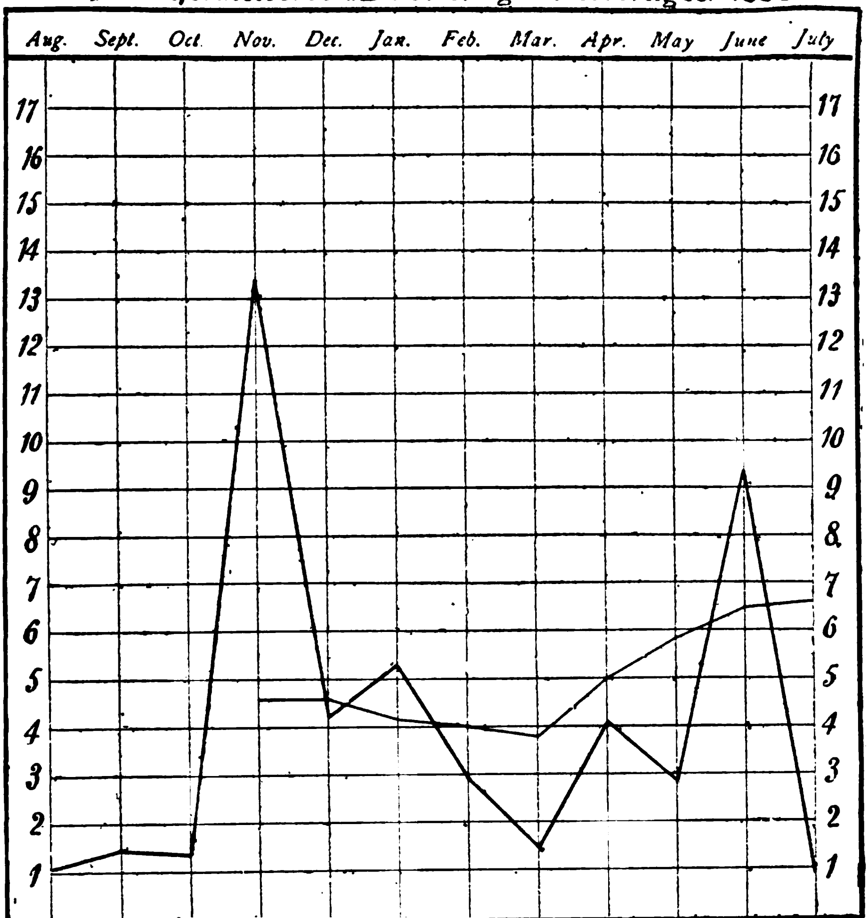
Temperature of Water. Degrees Fahr. Divided by 10.

Danbury Reservoir. Bacteriological Averages. 1889-90.



Bacteriological Averages. Divided by 100.

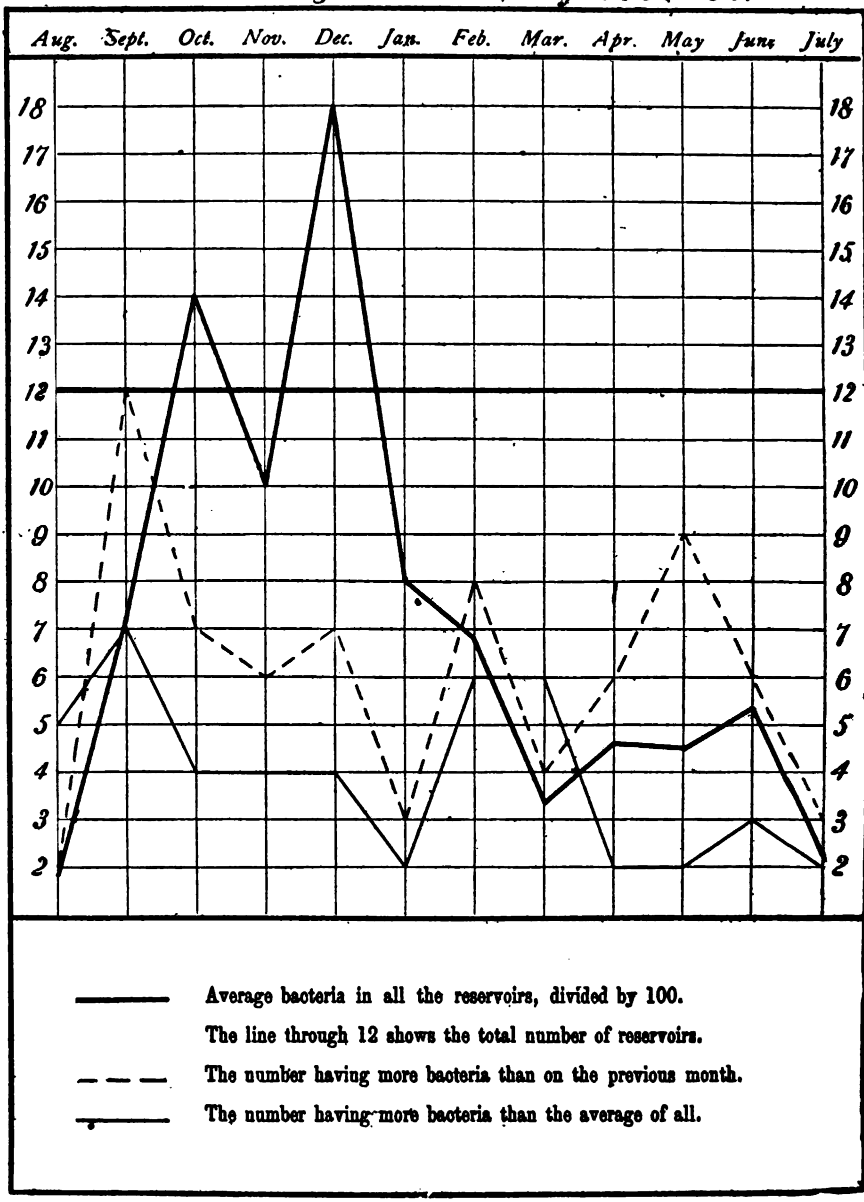
Stamford Reservoir Bacteriological Averages. 1889–90



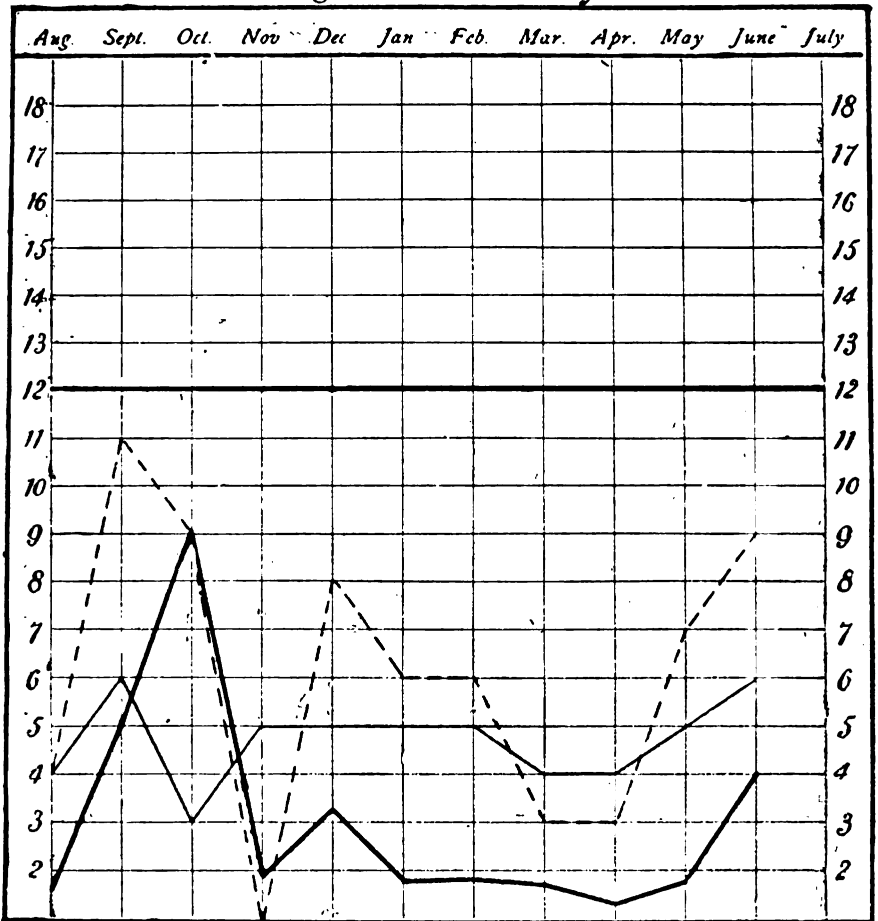
Bacteriological Averages. Divided by 100.

Temperature of Water. Degrees Fahr. Divided by 10.

Bacteriological Summary. 1889-90.



Bacteriological Summary 1890-91.



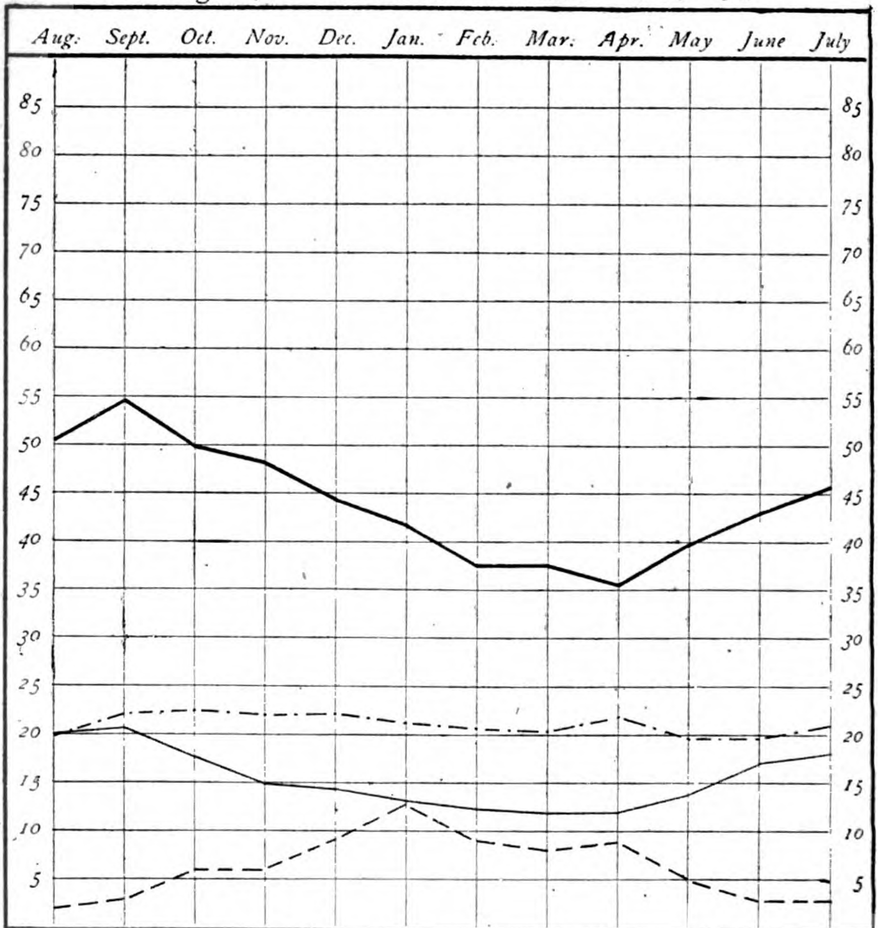
Average bacteria in all the reservoirs, divided by 100.

The line through 12 shows the total number of reservoirs.

The number having more bacteria than on the previous month.

The number having more bacteria than the average of all.

Averages for All the Reservoirs 1889-91.



Residue on Evaporation, Parts per Million.

Nitrogen of Albuminoid Ammonia, Parts per Million × 100.

Nitrogen of Nitrates, Parts per Million × 100.

Chlorine, combined, Parts per Million × 10.

REPORT ON THE CHEMICAL EXAMINATIONS.

By Herbert E. Smith, M.D.

METHODS OF CHEMICAL ANALYSIS.

The methods, which have been employed, have been uniform throughout the period of this investigation, and are similar to those employed by the chemists of the Massachusetts Board of Health, to whom we are indebted for many courtesies.

The advantages of pursuing the same methods, in the investigations carried on in adjacent States, seemed obvious, and where deviations from those of the Massachusetts Board have been made, they are such as have been necessitated by the more limited means and scope of the work in Connecticut, except that we have preferred to express the results obtained, in milligrams per liter, rather than parts per hundred thousand; and have expressed the results pertaining to nitrogen as so much nitrogen of free ammonia, and of albuminoid ammonia, rather than as so much ammonia.

Method of Collection.

The samples, for the chemical and microscopical examinations, were taken in one gallon bottles. These were carefully cleaned at the laboratory for each collection, and were sent to the collectors by express, in boxes, open at the top and lined with stiff corrugated paper. To each bottle was attached a tag-envelope, containing an addressed return envelope, directions for filling the bottle, and a certificate of collection to be filled out by the collector, and to be returned with the sample. The directions for collecting were as follows:

Instructions for Collecting Samples of Water for Chemical Analysis.

1st. *From a Water Tap.*—The water should run freely from the tap for a few minutes before it is collected. The bottle is then to be placed directly under the tap, and rinsed out with water three times, pouring out the water completely each time. It is again to be placed under the tap and filled to overflowing, and then a small quantity poured out, so that there shall be left an air-space under the stopper of about an inch. The stopper

must be rinsed off with flowing water, and inserted into the bottle while still wet, and secured by tying over it a clean piece of cotton cloth. The ends of the string must be sealed on the top of the stopper. Under no circumstances must the inside of the neck of the bottle or the stem of the stopper be touched by the hand or wiped with a cloth.

2d. *From a Stream, Pond, or Reservoir.*—The bottle and stopper should be rinsed with the water, and then, with the stopper in place, should be entirely submerged in the water, and the stopper taken out a distance of twelve inches or more below the surface. When the bottle is full, the stopper is replaced below the surface, if possible, and finally secured as above. *It is important that the sample should be obtained free from the sediment of the bottom of a stream, and from the scum on the surface.* If a stream should not be deep enough to admit of this method of taking a sample, the water must be dipped up with an absolutely clean vessel and poured into the bottle after it has been rinsed.

The sample of water should be collected immediately before shipping by express, so that as little time as possible shall intervene between the collection of the sample and its examination.

Collections were so ordered as to ensure the minimum delay in transportation to the laboratory, and the determinations of the changeable ingredients were made as soon as possible, usually within twenty-four hours.

On arrival at the laboratory, the certificates were numbered and placed on file, and the sample numbered with the same serial number, by which it was afterwards known in the laboratory.

Observations were first made concerning the suspended matter and sediment, the different degrees being noted as nearly clear, turbid, and very turbid, for the turbidity and very scanty, scanty, moderate, considerable and much, for the sediment. The sample was then well mixed, a portion removed for microscopical examination, and about one and a half liters filtered through carefully washed filter paper. When the bottle was thus partly emptied it was shaken and the odor observed.

Color.—Filtered water was compared with the ammonia standards (see below) in 50^{cc} tubes, and the results as given in the tables, represent the number of cubic centimeters of the standard ammonium chloride solution required to produce a similar color in 50^{cc} of distilled water, when treated with Nessler's reagent.

Total Solids.—This determination was made by evaporating 200^{cc} of the filtered water in a weighed platinum dish, to which had been added 5^{cc} of a standard solution of sodium carbonate, containing 0.010 grm. Na_2CO_3. The residue was dried for one hour in a water bath, cooled over sulphuric acid and weighed. The weight obtained, less the weight of the sodium carbonate added, gave the total solids in 200^{cc}.

Loss on Ignition.—The dish, with the total solids and the sodium carbonate, was ignited in another platinum dish as described by Prof. Drown.* The ignition was continued, until the residue was white or nearly so. The residue was then moistened with water, this evaporated, and the residue dried and weighed as before. The difference between the weights of the two residues is the *loss on ignition*, and as shown by Drown, is a close approximation, in the case of surface waters, to the total amount of organic matter present. With waters containing much organic matter it was found desirable, as tending to hasten the oxidation, to treat with water after a partial ignition, dry and again place in the ignitor.

This method has given excellent results in trial analyses, and was adopted, as it gives greater value to the item of loss on ignition, than the old method of igniting directly over the flame; and especially because it leaves a residue which can be used for the estimation of the chlorine, for as Drown has shown, and we have confirmed his results, there is no loss of chlorine even in the longest ignition.

Chlorine.—The residue of 200^{cc} of water, remaining from the solids determination, was treated with hot water, thoroughly rubbed with a glass rod and rubber, and washed into a beaker until the volume of the solution equalled 50^{cc}. In this solution the chlorine was determined by use of a silver nitrate solution, each cubic centimeter of which equalled 0.0005^{grm} of chlorine.†

Nitrogen of Free and Albuminoid Ammonia.—These determinations were made the first year on filtered water only, but on both filtered and unfiltered water the second year. The 500^{cc} for the determination were measured in a pipette, by means of which the water was taken from the bottle and introduced directly into

* On the "Loss on Ignition" in Water Analysis, Technology Quarterly, Dec., 1888, Jour. Analyt. Chem., Vol. III, p. 142.

† See Allen Hazen on the Determination of Chlorine in Water, Am. Chem. Jour., Vol. XI, p. 409.

the distillation flask, with the minimum risk of contamination. The measurements were accurate and also rapid, as the lower opening of the pipette had a diameter of one-quarter inch. A small quantity of sodium carbonate solution was added for the free ammonia determination, and 40^{cc} of alkaline permanganate solution for the albuminoid ammonia; this reagent was also added directly from a pipette.

Distillation was effected in a liter flask, connected by a cork stopper with a condensing apparatus, similar to that described by Prof. S. W. Johnson for nitrogen determinations by the Kjeldahl method.* The corks were cleaned by prolonged boiling, and the apparatus covered, and closed tight by means of rubber caps on the condensing tubes, when not in use. The distillates were collected in the Nesslerizing tubes, which were 11½ inches long and ⅝ inch in internal diameter. The 50^{cc} mark was 9 inches from the bottom. Three tubes were distilled for the free ammonia, all of them being read, and five tubes for the albuminoid ammonia. The average time for distilling 50^{cc} was nine minutes.

The standard tubes were made for each set of determinations, and were treated with the reagent at the same time as the distillates, care being exercised to have all the tubes of nearly the same temperature. Tubes requiring 5^{cc} or more of the standard ammonium chloride solution were read by means of Hehner's colorimeters. The permanganate used yielded ammonia equal to 0.2–0.3^{cc} of the standard solution. This was not deducted in determinations of surface waters. The standard ammonium chloride solution was made to contain in each cubic centimeter 0.00001^{grm} of nitrogen.

Organic Nitrogen.—This factor was determined in all the samples the first year, as follows: Half a liter of the water was mixed with 10^{cc} of concentrated sulphuric acid in a round bottom liter flask of hard glass. The flask was placed over a lamp in an inclined position, the water evaporated by gentle boiling, and the remaining acid boiled over a small flame until it was nearly colorless. A little potassium permanganate was then added and the acid heated until colorless. After cooling it was washed into the distilling flask with 200^{cc} of ammonia free water, made alkaline with sodium hydroxide, and about 175^{cc} distilled off into a receiver containing a very little hydrochloric acid. The distillate was made up to 250^{cc} and Nesslerized. From the total nitrogen obtained there was deducted the amount previously determined

* Jour. Analyt. Chem., Vol. IV, p. 179.

as nitrogen of free ammonia, and also a correction for reagents as determined in a blank experiment.

Nitrogen of Nitrites.—The water was decolorized by shaking about 200^{cc} in a bottle, with precipitated and carefully washed aluminum hydroxide. The clear supernatant water was decanted into 50^{cc} tubes, of the same size as those used for Nesslerizing, and treated with hydrochloric acid, sulphanilic acid and naphthylamine hydrochloride, according to the method of Griess. A set of standards was made at the same time and by the same method, and all allowed to stand for thirty minutes before reading, so as to fully develop the pink color, which is produced by nitrites in this test.

Nitrogen of Nitrates.—Ten cubic centimeters of the water which had been decolorized for the nitrite determination, were evaporated in a small porcelain dish, with five drops of the same sodium carbonate solution as used in the total solids determination. The residue was treated with phenol sulphonic acid in sulphuric acid, water and ammonia, according to the method of Grandval and Lajoux. The yellow color produced by the nitrates was compared with the standards, prepared fresh for each set of readings, in 10^{cc} tubes.

Oxygen consumed from Permanganate.—This determination was made on all samples during the second year and was conducted as follows: To 200^{cc} of the water in a flask there were added 10^{cc} of sulphuric acid (1–5), and 10^{cc} of the permanganate solution. The contents of the flask were brought to the boiling point and maintained at, or just below, that point for 30 minutes; more permanganate being added from time to time, if necessary to maintain a distinct red coloration. Ten c.c. of oxalic acid solution were added, and the still hot solution titrated with the permanganate to faint red coloration. From the total amount of permanganate used, there was deducted the amount required to oxidize the oxalic acid. The available oxygen of the remainder had been consumed by the organic matter and nitrites of the water. Each cubic centimeter of the permanganate solution used yielded 0.0001 grm. of oxygen.

Hardness.—Determinations of the hardness of all the samples of the second year were regularly made. The determinations were made on 100^{cc} of water by means of an alcoholic soap solution, according to the well known method of Clark. The soap solution used was equivalent to 0.001 grm. of calcium carbonate for each cubic centimeter, and the results are given as the hard-

ness equivalent to that produced by so many milligrams of calcium carbonate, per liter.

Remarks on the Significance of the Chemical Results of Water Analysis.

The value of the opinion of an analyst concerning a given sample of water, which has been presented to him for examination, depends not only upon the fullness of his analyses, but also upon the extent of his knowledge concerning the surroundings of the source of the sample. This knowledge is sometimes not furnished with the sample, to the end, that the analyst may render an unbiased opinion, frequently to the great detriment of the value of the opinion rendered. A person, suspecting that food has been poisoned, may submit a sample to a chemist, who may readily detect therein the poison, arsenic, and render a definite opinion concerning the deleterious nature of the sample, thereby positively confirming a suspicion which the person had entertained. So a chemist may receive a sample of water, and by the various tests bearing upon the detection of organic matter, determine its presence and approximate amount, but in rendering his opinion, he is met by the fact that the organic matter in the water is not necessarily harmful. It may have come from harmless vegetable material, or it may owe its origin to a highly poisonous sewage. Possibly the other data of the analysis may furnish sufficient information to render a satisfactory opinion possible, but it may readily be, that the results of the analysis cannot be positively interpreted without a full knowledge of the surroundings of the source of the sample, or, it may be, even the knowledge to be gained by repeated analyses. This full knowledge is largely of value, because it permits the comparison of the results of any given analysis with the composition of the normal waters of the same class, in the region from which the given sample came.

It may be remarked that it is better to value the opinion of the analyst, according to his experience and reputation for scientific accuracy, rather than to attempt to secure an unbiased opinion by withdrawing facts necessary for a satisfactory judgment.

While a good knowledge of the composition of the normal waters of any region is of the greatest value in the interpretation of analyses, it would appear that there is no good basis for the establishment of fixed limits for all the various items of analysis, below which a water is to be pronounced good, and above which it is to be condemned. Especially to be avoided is too strict use

of the "standards" which have been adopted by this or that author, as the result of experience in foreign countries having dissimilar geological and climatic conditions.

For the convenience of water superintendents and others interested in our water supplies, and consequently interested in the interpretation of the analyses given in this report, the following comments are made on the various data sought in water analyses.

Solids.—The dissolved solids of water consist of mineral matter and organic matter, which in the analyses as made in this series, are expressed, respectively, with close approximation, by the terms fixed and volatile solids.

The mineral matter is extracted from the ground over which, or through which, the water flows, and varies considerably in the different reservoirs, and at different times in the same water. Of the waters examined, the Lake Whitney, New Britain, and Hartford samples gave the highest averages; 52.3, 49.5, and 48.6 parts per million, respectively. While the Waterbury, Thomaston, and Rockville samples gave the lowest; 20.5, 21, and 21.4 parts per million, in the order named. Even the highest amount is small and of little sanitary importance, although the kind and amount of solids is of more significance to the manufacturer. The kind of solids varies with the nature of the ground and exposure of the water to it. Water extracts but little from the hard siliceous rocks, much more from limestone and cultivated fields. We have few mineral analyses of our waters, but the following will serve as illustrations of their constituents. No. 1 is an analysis of Lake Whitney water, drawn November 17, 1891, at the steam pumping station, and filtered through paper. No. 2 and No. 3 are, respectively, from a reservoir and from a small stream in the town of Manchester.

	No. 1. Lake Whitney.	No. 2. Reservoir.	No. 3. Small stream.
Total Solids	66.	37.5	34.7
Volatile Solids (Organic)	3.5	8.5	7.0
Fixed Solids (Inorganic)	62.5	29.0	27.7
Calcium	16.5	3.4	3.0
Magnesium	1.1	0.7	0.6
Sodium	3.8	....	....
Potassium	0.1	....	....
Ferric Oxide and Alumina	0.8	0.4	0.5
Silica	7.3	9.6	9.9
Chlorine	3.2	1.6	1.5
Sulphuric Acid, SO_4	2.7	1.3	1.1
Organic Nitrogen	0.322	....	....

According to these data the inorganic matter in this sample of Lake Whitney water may be thus stated:

		Parts per Million.	Grains per U.S. Gallon.
Calcium Carbonate		38.5	2.248
Calcium Sulphate		3.8	.222
Magnesium Carbonate		3.8	.222
Sodium Chloride		5.1	.297
Silica	7.3		
Alumina and Ferric Oxide	0.8	11.5	.672
Potassium Oxide	1.2		
Sodium Oxide	2.2		
Total		62.7	3.661

The *hardness* of a water depends chiefly on the amount of calcium carbonate which it contains. All of our surface waters are soft compared with those which are in successful use in limestone regions. There is, however, considerable variation in different parts of the State. The relation between the waters examined during the second year, is shown in the following statement of the average hardness, expressed in parts of calcium carbonate per million:

Waterbury	6.1	Meriden	17.4
Rockville	6.7	Middletown	18.5
Thomaston	7.6	Saltonstall	24.6
Norwich	7.9	Hartford	26.4
Willimantic	10.9	New Britain	32.0
Bridgeport	12.8	Whitney	33.0

The volatile solids, in the class of waters investigated, are composed almost wholly of organic matter of vegetable origin and may be derived from the leaves, and debris of the higher plants, with which the water has been in contact, or from the algæ, and other water plants, which grow and decay in the water. Lake Wintergreen and the Thomaston water, illustrate respectively these two sources of organic matter. The Thomaston, Lake Wintergreen, and Middletown samples, gave the highest averages, 12.8, 11.4 and 11.1 parts per million, while the Lake Whitney, Meriden and Waterbury samples gave the lowest averages, i. e. 6.3, 7.9 and 8.1 parts per million in the order named.

Reservoirs containing organic matter derived largely from leaves etc., as those of Willimantic and Norwich, gave results indicating greater stability in their chemical constituents. They

also cause much less complaint from the consumers, than those containing the products extracted from algæ and the other succulent water plants, like the Thomaston, New Britain and Middletown reservoirs.

The charts of the averages of all the determinations show the greater amount of solids during the late summer and fall months; this is largely due to the greater amount of organic matter incident to the decay of the vegetable forms, but partly also to the greater general concentration of the water, due to evaporation and smaller amount of rain. The difference between the results of the two years is also noteworthy.

Chlorine.—The chlorine in surface waters is always in combination with metals, and we may consider it as existing in combination with sodium, in the form of common salt. Water may derive its chlorine from salt deposits in the soil, from sewage, or from rain, but in this state we have to concern ourselves chiefly, if not wholly, with the last two sources.

The composition of sewage varies with the amount of diluting water per capita, and the character of manufacturing waste, which it contains. The following tables show the averages of a large number of analyses of sewage, in comparison with the composition of the water supply.*

	Dissolved Solids.	Chlorine.	Nitrogen of Free Ammonia.	Nitrogen of Albuminoid Ammonia.
London, England				
Sewage	847.	150.	37.212	4.509
Water	275.	16.2	0.000	.064
Difference	572.	133.8	37.212	4.445
Lawrence, Mass.				
Sewage	356.3	52.5	14.998	4.369
Water	38.3	2.1	.012	.088
Difference	318.0	50.4	14.986	4.281
Worcester, Mass.				
Sewage	253.5	41.7	15.458	2.604
Water	26.5	1.4	.016	.130
Difference	227.0	40.3	15.442	2.474

From calculations based upon the data relating to the sewage of London, Lawrence and Worcester, it appears that the following is the average daily contribution to the sewage, per inhabitant:

Free Ammonia.	Albuminoid Ammonia.	Dissolved Solids.	Chlorine.
0.015 pounds.	0.003 pounds.	0.218 pounds.	0.042 pounds.

*These tables are from the Report on the Examination of Water Supplies published by the Mass. Board of Health in 1890, pp. 736–88.

These data all show that sewage contains a large amount of chlorine, and therefore that the addition of sewage to normal water must increase its chlorine. This addition may be by direct flowage of sewage into a stream, or by percolation from an inhabited drainage area. For chlorides once being added to water must remain in it, as they, unlike the ammonia and organic constituents of sewage, are not altered by the oxidizing action to which water is subjected in percolating through the soil. Using data from several sources, Prof. Drown calculates that twenty persons per square mile will add, on the average, 0.1 of a part of chlorine per million of water flowing from this area.*

The amount of chlorine in a water uncontaminated with sewage, i. e., a normal water, varies in different parts of the State. Especial attention is called to the map of Connecticut on another page of this report, on which is shown the average chlorine in the several reservoirs examined. These determinations are not sufficiently numerous to establish the normal chlorine of the different sections of the State, but they show in a striking manner that the amount of chlorine varies in different sections, and that it diminishes as one goes north and west through the State, that is, as one recedes from salt water. Thus, beginning at Norwich with an average of 2.45 parts of chlorine per million, and proceeding northward, we find the average at Willimantic to be, 1.84, and at Rockville, 1.66. Proceeding in a westerly direction we find these averages, Norwich 2.45, Middletown 2.29, Waterbury 1.98; or a little further north, Willimantic 1.84, Hartford 1.58, Thomaston 1.49. Lake Saltonstall gave the highest average, 3.70, and it lies the nearest of all the reservoirs to the salt water of the Sound.

From the results of investigations published by the Massachusetts Board of Health, it appears probable that in that State, the normal chlorine of the ground water is the same as that of the surface water of the locality. Where they are the same we must look to the rain fall as the source of the chlorine. An examination of the results for chlorine will show in all of the reservoirs a considerable variation in the successive examinations of any one source. The explanation of these differences is to be sought in the effects of evaporation and the varying amount of chlorine in the rains, depending on the direction and velocity of the wind. In the chart showing the

* Ibid., p. 680.

monthly averages of all determinations, the general uniformity of the amount of chlorine is noteworthy, and is to be explained by the dependence of the normal chlorine upon the rainfall.

In the analyses of rainwater collected in New Haven (see p. 236), it was found that the amount of chlorine in the water precipitated during fourteen months was 1.77 parts per million. As has been stated in a previous report* the average flow of the streams in Connecticut is about sixty per cent. of the rain fall. If we assume, what is probably very nearly true, that the remaining forty per cent. is evaporated, we may calculate that the rainwater undergoes a concentration, by evaporation, in the ratio of 5:3. This amount of concentration would raise the chlorine from 1.77 to 2.95 parts per million, which amount would be the normal chlorine for New Haven, according to the data given, if the normal chlorine is dependent on the salt precipitated with the rainwater. Of course there can be no data for an actual comparison at New Haven, but it will be observed that during the same year, the average chlorine was 2.70 at Lake Wintergreen, an uncontaminated reservoir lying four miles *northwest* from the city.

Because of the positive significance of chlorine in determining the amount of sewage contamination in our waters, it is highly desirable that much more information should be obtained concerning the amount which is normal to the different sections of the State, and this should be done by extended systematic examinations of unpolluted small streams and springs, and analyses of rain water.

Nitrogen.—This element may occur in water in organic combinations, as ammonium salts, especially the carbonate, or as salts of nitrous and nitric acids. These forms are not permanent but so change, that the same nitrogen may exist in each of them at different times.

The *organic matter* may be derived by extraction from vegetable or animal tissues or from sewage; in the waters with which we have to do, it is chiefly derived from leaves, the materials found in swamps, or from the floating organisms and fixed plants which grow so abundantly in many ponded waters.

The nitrogenous constituent of this organic material is measured by the amount of ammonia evolved, when heated with alkaline permanganate, i. e., by its albuminoid ammonia. Not all

* Report of the Conn. State Board of Health, 1888, p. 239.

of the nitrogen present in organic combinations, is evolved by this process, nor is the proportion thus evolved always the same, but the ratio is nearly enough constant to subserve the purposes of the analysis. The proportion of nitrogen that is evolved is shown in the following table of average results obtained in monthly examinations of twelve reservoirs during the year 1889-90:

	No. of Samples.	Albuminoid Nitrogen.	Total Organic Nitrogen.	Nitrogen evolved as Albuminoid ammonia
Thomaston	12	0.229	0.420	54.5%
New Britain	12	.183	.327	55.9
Lake Wintergreen	12	.174	.314	55.1
Middletown	12	.169	.289	58.4
Lake Whitney	12	.150	.285	52.6
Waterbury	11	.154	.278	55.2
Danbury	11	.147	.275	53.5
Norwich	12	.144	.252	57.1
Meriden	12	.134	.239	56.1
Willimantic	12	.121	.218	55.0
Hartford	12	.129	.215	60.0
Stamford	12	.119	.215	55.3
	142	0.152	0.273	55.7%

According to these results the ratio of nitrogen evolved as albuminoid ammonia, to total organic nitrogen is as 1:1.8. In a series of examinations of surface waters collected in Massachusetts during the months, June, July and August, 1888, Drown and Martin* obtained the following results:

No. of Samples.	Albuminoid Nitrogen.	Total Organic Nitrogen.	Nitrogen evolved as Albuminoid ammonia.
61	0.176	0.392	44.9%

The ratio of the nitrogen of albuminoid ammonia to the total nitrogen in this series is 1:2.2.

As the result of several hundred comparative determinations, Prof. Drown states, that the total organic nitrogen is about twice that of the albuminoid ammonia.

The average amount of nitrogen of albuminoid ammonia, in 176 determinations in the water of fifteen reservoirs, is 0.1545 parts per million, which corresponds to about 0.309 parts of organic nitrogen. This amount of nitrogen would be contained in 1.931 parts of albumin, containing 16 per cent. of nitrogen, but

*On the Determination of the Organic Nitrogen in Natural Waters by the Kjeldahl Method. Technological Quarterly, vol. ii, No. 3, and Jour. Analyt. Chem., vol. iii, p. 258.

the loss on ignition in the same samples is 9.35 parts, and this, as has already been stated, is a close approximation to the organic matter present in the water,* consequently not over 20.6 per cent. of the organic matter could have existed in forms containing as much nitrogen as albumin. While it seems certain that some of the organic matter is non-nitrogenous, it is also certain that some of the nitrogen is contained in forms containing less than does albumin.

The average amount of organic matter given above, 9.35 parts per million, is only 0.55 grain per U. S. gallon. The largest loss on ignition found in any sample during the second year, is that of the Thomaston sample of September, which gave 25.5 parts per million, or 1.49 grains per gallon of organic matter.

Some waters contain at times such large numbers of floating algæ, as to give the impression of large amounts of organic matter. In order to obtain data for the estimation of the amount really contained in these forms, a quantity of blue-green algæ, consisting almost wholly of *Clathrocystis* and *Anabœna*, in about the proportion of 3 to 1, was filtered out of the water in which they occurred, and suspended in distilled water. Measured quantities of this mixture were used for determination of the solid residue and of the total nitrogen. The residue dried at 100° C. was found to contain 6.3 per cent. of nitrogen.

The sample containing the largest amount of suspended matter was that of New Britain for September, 1890. It was very turbid, and gave 0.420 parts of nitrogen of albuminoid ammonia in the filtered, and 1.296 parts in the unfiltered water, leaving 0.876 for that derived from the suspended organisms.

The organisms most abundant were groups of *Anabœna*, and assuming for them the composition given above, this amount of nitrogen of albuminoid ammonia corresponds to the presence of 27.8 parts per million, or 1.62 grains per gallon, of dry organic matter.

The amounts of dissolved and suspended organic matter in the examples cited are very exceptional, and have a most marked influence on the character and appearance of the waters, still 1.49 and 1.62 grains of organic matter are in themselves very small quantities of material when it is considered that they are diluted to one gallon. We cannot, however, doubt that these amounts and even much smaller quantities may have much sanitary significance.

* See methods of analysis.

It is a matter of common observation that certain waters produce diarrhœal and other disturbances in persons in good health, but unaccustomed to their use. The somewhat indefinite characters of the symptoms alleged to be thus produced, and their common production by other causes, make it difficult to fix with certainty their relationship to the water in certain cases. But it is easy to believe, that causes that certainly do produce disturbances in healthy persons at certain times, may also be the cause of illness in feeble persons even though they habitually use the water. Cases have been reported in which large groups of persons have been made ill by the use of water, or ice made from water, highly contaminated with organic matter of vegetable origin, and which as far as could be ascertained, was not contaminated with sewage or other animal matter.*

While we may not cite cases in our own State, in which such gross contamination of a water has existed as to have caused illness in a large proportion of those using it, still it would seem certain that an impure water supply may be the cause of illness in a community, quite independent of the causation of typhoid fever or other infectious diseases.

We can conceive of two ways in which the organic matter in water may have an injurious effect on those using it; i. e. by the direct effect of the material itself, acting as would a drug; and effects produced by products incident to the biological changes in the water, which are induced in part by the organic matter.

When the organic matter is simply the extractives of undecomposed vegetable matter, it is difficult to see how the amounts which are found in waters, which would be considered potable, can have any injurious effect. It is well known that many peaty waters having much deeper color, and containing much more organic matter than any in use in our State, are in common and apparently successful use elsewhere. Highly colored waters from old woodland and swamps are not free from the accusation of injurious effects on those using them, but this form of organic matter appears to be rather stable, and such waters give little trouble from those causes attributable to the processes of decay.

The waters which have caused the most complaints from consumers in this State, are those more nearly colorless, which have derived most of their organic matter from the debris of water plants, or at least those in which there are large annual growths

*See Conn. State Board of Health Report, 1888, p. 289.

of such plants, examples of which may be found in reservoirs of Thomaston, New Britain and Middletown.

That the albuminous matter from such sources has a special tendency to decompose we cannot assert, but the fact that in waters of the kind mentioned, the plants grow and decay in the water, is a sufficient explanation of the much greater changes that are observed in the chemical composition of these waters. In growing, the plants assimilate the organic matter, the ammonia and nitrates of the water, and for the time hold these nitrogenous elements in an insoluble form. If they could then be removed the water would be purer than before, but as they are not removed it receives the products of their decay, and the total organic impurity is much increased.

While it is very desirable to keep the water plants from developing in our reservoirs, it is difficult to do so, as the conditions affecting their growth are not all known. Two objects to be aimed at in the construction of reservoirs, as of value in this connection, would appear to be obvious; first, to make them of moderate depth, that the water may not be overheated as it is in shallow places by the action of the sun; and second, to construct and maintain a well cleaned bottom, that the plants may not there attach themselves and find nourishment. Reservoirs so covered as to be dark do not support the most noxious vegetable growths. The same may be said concerning waters in rapid motion, consequently, supplies taken directly from large streams are not liable to troubles of this sort.

Sewage furnishes abundant nourishment for plants, and its presence in water must be a potent factor in their development. This would appear to be true, whether the sewage is added directly or whether it reached the reservoir after percolation through the ground. For in the first instance there are abundant ammonium salts, in the second, there are nitrates, and either of these is an excellent plant food.

Aside from the unsavory organic contamination caused by sewage, and its influence on the development of objectionable forms of plant life, the presence of sewage in water is especially noxious because of its liability to contain the contagium of infectious diseases, notably, typhoid fever and cholera. These are living organisms, bacteria, which are capable of increasing in number by reproduction, and although they may not find in a given water, the conditions favorable to their reproduction, they are

yet capable of retaining their vitality for considerable periods, certainly long enough to be transported several miles from the place of infection and to be distributed in a virulent form by the ordinary methods of water distribution. This has been demonstrated far too many times to admit of doubt.

The Free Ammonia.—The sources from which bodies of water may derive their ammonium salts are, the rain, sewage, and the decomposition of organic matter in the water, or on the collecting areas.

The amount of ammonia in rain water is large and variable, but the results of analyses of rain water collected in New Haven, as given on another page, show much greater amounts of ammonia than is found in the rain in the country districts, in which the air is free from the contaminating influences of a large city. Although rain water contains notably larger quantities of ammonia than reservoir waters usually contain, it does not appear that the rainfall at any one time perceptibly influences the proportion of ammonia in the reservoir. The sudden melting of large masses of snow, however, may do so.

As is shown in the analyses of sewage, quoted on page 371, high free ammonia is a characteristic of sewage. Direct addition of sewage may, therefore, notably increase the proportion of free ammonia in a water; especially is this true during the cold months when vegetation is much less active in removing the excess of this compound. It is believed that none of the reservoirs included in this report are subject to direct sewage contamination, so that we must look to the decomposition of vegetable matter in and about our reservoirs as the source of their free ammonia.

The term, free ammonia, is applied to that ammonia which is evolved when the water is distilled in the presence of a trace of sodium carbonate. We do not believe that it exists as ammonia dissolved in the water, but that it chiefly comes from the decomposition of ammonium carbonate during the process of boiling. That a part of it may be evolved from the organic matter during the process, is shown by a comparison of the free ammonia obtained from filtered and unfiltered water. The amount from the unfiltered water is greater, and although it is usually only slightly greater, the difference may be considerable, as in the Thomaston sample of August, 1890, in which the free ammonia of the filtered water was 0.114 and of the unfiltered water, 0.340 part per million.

Excluding the three reservoirs in which there were marked irregularities in the amount of ammonia, it is seen that on the whole the quantity of free ammonia is very small in our surface waters, the average amount being about 0.020 part per million. This shows that in general the assimilation by plants keeps pace with the development of ammonium salts by the processes of decomposition. High free ammonia, or marked irregularity in this factor, is then an indication of excessive decomposition changes in the organic elements of the water. It is these unstable waters, that cause the greatest complaint from the consumers.

In those reservoirs in which large quantities of plants grow and decay, there is likely to be an accumulation of mud, rich in organic matter, and prone to undergo putrefactive changes. The character of such accumulations is shown in the following example: A quantity of mud was collected on August 26, 1891, from the bottom of the Middletown reservoir at a point where the water plants grew abundantly. Quantities of the moist substance were mixed with distilled water and examined with the following result:

ANALYSIS OF MUD FROM A RESERVOIR.

Mud taken	1,000,000.	parts	by weight.
Nitrogen of Free Ammonia	21.	"	"
Nitrogen of Albuminoid Ammonia	1,045.	"	"
Total Nitrogen	1,869.	"	"

This amount of nitrogen would require the presence of 1.17 per cent. of albumin, if it were all in that form. The mud was greenish black in color, contained many diatoms and rhizopods, and emitted a foul odor. Such material readily undergoes putrefactive changes and communicates the products formed to the water in contact with it. When the water is stagnant, it may thus become very highly charged with ammonia, ill smelling gases, and other products of decay. It has been shown by the researches instituted by the Massachusetts Board, that the wind may set the water into circulation to a depth of twenty feet. And thus, this foul water may, from time to time, be mixed with and contaminate the superficial and purer water of the reservoir. The stagnant water in reservoirs of a greater depth than twenty feet also rises and disseminates its impurities in the fall, owing to temperature changes that then take place. In Massachusetts the temperature of the water at a depth of forty feet or more, is found to be about 45° F. Water is heaviest at a temperature of

40°, consequently the lower layers of water, below the influence of the wind, are practically stagnant, until by the cooling of the surface water, on the approach of the cold months, this sinks and the relatively lighter water below rises. Not until the surface is lowered below 45° would the whole mass of water be set in motion. That these conditions of stagnation, pollution and dissemination do take place as described, has been abundantly shown by the work done in Massachusetts. The following determinations of *free ammonia*, at different depths, in Jamaica Pond, may be quoted from the Report before mentioned to illustrate the change that takes place in the fall.

Depth in feet,	0	10	20	30	40	50	Average.
On Oct. 22, 1889...	0.068	0.068	0.064	0.920	4 200	5.920	0.773
On Nov. 27, 1889...	.640	.520	.672	.624	.704	.612	.619

The figures represent *free ammonia* in parts per million. In calculating the average, due allowance was made for the volume of water at each depth.

Nitrogen as Nitrites and Nitrates.—Nitrogen as ammonia does not long persist in this form .in water, but is either assimilated by living plants, becoming a part of their organic constituents, or it is converted into nitric acid by the activities of certain bacteria. This nitric acid unites with sodium or calcium and exists in the water as nitrates of these bases. This is an oxidizing process, and where water is subjected to it under the most favorable conditions, as in intermittent filtration through sandy soil, it is found that its nitrogen exists almost wholly in this form. This is true of the purest well and spring waters. The nitrates, then, are to be considered as the products of the complete oxidation of other forms of organic matter.

The *nitrites* contain less ogygen than the nitrates; they are the products of incomplete oxidation, or they may be considered as an intermediate form between the other nitrogenous bodies and the nitrates. They are not stable bodies but tend to pass quickly into the form of nitrates. Their general significance, therefore, is the same as notable quantities of ammonia, that is, their presence indicates a condition of change or instability in the water. They do not, however, seem to be as much affected by season as the ammonia, and they are especially abundant in water receiving sewage. The amount of nitrogen as nitrites in our reservoir waters is always very small, the average of all determinations being 0.0011 part per million. The lowest annual

average in any reservoir is 0.0003, and the highest, in Lake Whitney for 1889–90, 0.0023 part per million. Many samples contained no nitrogen in this form; the largest amount found was in the Thomaston sample of November, 1890, namely, 0.008. Lake Whitney shows their presence most constantly, and this is to be attributed to the fact that this supply undoubtedly receives a larger proportion of drainage from inhabited areas than any of the other reservoirs.

The *nitrates* are much more constantly present than the nitrites and in larger, though still small, amounts. The average amount of nitrogen in this form in all of the analyses is 0.06 part per million, the largest amount is 0.24, some of the samples, especially during the warm months, were quite free from it. As is shown in the chart of averages, there is a notable increase during the cold months. This is to be ascribed to the diminished activity of plants during this period. The nitrates are entirely without effect on the health of those using a water containing them, even when they are present in very much larger quantities than in any of our waters. Nevertheless they are of much importance, for they give information concerning the history or source of the water containing them, and they serve as food for water plants.

The nitrogenous matter of sewage is almost entirely converted into nitrates, when it is allowed to percolate through a porous soil. It thus happens that the ground water of inhabited regions contains nitrates, sometimes in very large amounts; for example the water of the well on the Green in New Haven, contains an average amount of about 12 parts per million of nitrogen of nitrates, although it is of good organic purity; some other wells in the city yield as much as 30 to 40 parts per million. On account of this connection with sewage, nitrates are taken as a measure of the *previous sewage* contamination, as free ammonia, nitrites and albuminoid ammonia, are taken as the measure of recent sewage contamination. The relationship in the two cases is to be taken with about the same limitations, for while ammonia and its companions may exist in waters entirely independent of any sewage contamination, so may nitrates, but it is true that waters receiving sewage contamination show high average nitrates, particularly are they high during the winter months when plants are less active in removing them. The nitrates in Lake Whitney are not high, but that they are higher than in the other reservoirs examined, is to be explained by the character of the

drainage area. While the nitrates derived from sewage must be regarded as entirely harmless in a sanitary sense, it unfortunately has not been demonstrated that the processes which are efficient in effecting this purification of sewage are also effective in freeing it from pathogenic bacteria, which constitute the worst elements for evil in sewage. It has also been shown that an amount of filtration that will prove effective, in the sense of complete nitrification, under ordinary conditions, will fail at times, as when the filtration is too rapid or the admixture of sewage too great. A water therefore, that is subjected even to past sewage contamination must be regarded with suspicion, although it may ordinarily be safe.

Aside from the evil effects that may rise from the direct action of sewage, waters containing nitrates have in them a favorite food supply for the development of plants. The disagreeable consequences which arise from excessive growth of plants due to this cause, have been particularly observed in the case of ground waters, pumped from wells and stored in reservoirs. The practical remedy for this trouble has been found to be to cover the reservoirs, thus keeping the water dark and cool. This remedy cannot be applied in the case of large storage reservoirs, consequently this constitutes another reason for excluding from these reservoirs, waters coming from inhabited areas.

Odor and Taste.—Waters coming in contact with the material in swamps, wood mould, or other accumulations of vegetable matter, commonly acquire an odor more or less characteristic of the source, and which may be described as swampy, woodlike, etc. These are common in our ponded waters, but are usually slight and of little moment.

The grass-like and vegetable odors noticed in waters appear at times to be due to the presence of diatoms and green algæ. Prof. Drown states that some samples of water from which these organisms have been removed by filtration, present no odor on being boiled, whereas, if they are not removed, the odor increases on boiling, thus indicating that the odor is dependent on the organisms.

The odors which are troublesome, are those which are developed from time to time in some of our reservoirs, and which are strong and frequently of a disgusting character. Most commonly the odors are described as fishy, but other terms are also used. Popularly, they are ascribed to putrefactive decompo-

sition, and sometimes erroneously to the decomposition of fish lodged in the pipes. Regarding the true causes of these disagreeable odors, it must be said that the conclusions of different observers are not in accord, but it would appear that there are two distinct classes of them; one class including those odors which are the products of putrefactive changes, and the other including those which pertain to organisms entirely independent of any putrefaction.

Under the head of free ammonia, mention has already been made of the putrefactive character of the mud at the bottom of some reservoirs, and it has been stated that the water lying stagnant in contact with this mud, becomes at times highly charged with free ammonia, foul smelling compounds and the other evidences of decay. When this foul water is set into circulation it imparts its character to the water of the reservoir and the odor thus caused may be sufficiently marked to cause much complaint.

The blue-green algæ produce very offensive products of decomposition, as I have convinced myself by experiment with *Clathrocystis* and *Anabœna*, and they may be present in reservoirs in sufficient quantities to notably affect the odor of the water, producing the so-called pigpen odors. Apparently also bad odors in water have in certain cases been attributed with justice to the decomposition of sponges.

It would appear to a chemist, that those biologists, who have reached the conclusion that foul odors in water are usually the result of putrefactive changes, have not given sufficient weight to the entire lack of evidence of the presence of other products of decay in the results of chemical analyses in many cases in which the odor has been most marked. Others have reached the conclusion which appears to the writer to be most in accord with his observations and knowledge, namely, that frequently, perhaps usually, in those cases most complained of by the consumers, the odors in the water are the specific odors of certain organisms. This assumes, what one by analogy may readily admit, that some of the lower organisms contain or excrete strongly odorous principles, just as certain of the higher organisms do, for examples the garlics and mints among plants and certain bugs among animals.

As is mentioned above, many of the algæ seem to possess a grass-like or vegetable odor that is not disagreeable; among the

organisms to which disagreeable odors have been ascribed, are particularly *Uvella*, *Uroglena*, *Volvox*, *Dinobryon*, and *Asterionella*. *Uroglena* has appeared in sufficient numbers to cause trouble in several of the reservoirs in this State, as in the Cooke st. reservoir at Waterbury, and in the reservoirs at Meriden, Middletown and Wallingford. This organism is very fully described by Prof. Williston in his Report, and is referred to here only to present such evidence as has been observed as to whether the odor is due to putrefactive changes or not.

In each case where this organism has been observed in notable numbers, the odor complained of has been a nauseous fish-like odor. When the odor was most marked in the water drawn from the taps at a distance from the reservoir, it has been slight in the water of the reservoir, even when the sample was taken directly at the inlet to the mains, as was the case at Wallingford. The odor has disappeared from the sample as it stood in the laboratory in from one to three days.

In May, 1891, the water delivered to consumers in Wallingford caused much complaint. Samples were taken from the reservoir at the entrance into the mains, from the gatehouse, 800 feet away, and from a tap in the borough. They were delivered at the laboratory from five to six hours after collection. The samples from the reservoir and from the gatehouse contained many colonies of *Uroglena* and but little of the peculiar odor, which was marked in the sample from the tap; this, however, contained very few of the colonies, though there were some fragments visible under the microscope. Chemically the samples were almost identical. The reservoir was visited and about ten gallons of water collected near the surface were filtered through loose layers of absorbent cotton. The pieces of cotton were put into a wide-mouthed quart bottle and gently mixed with water in sufficient quantity to fill the bottle to about three fourths of its capacity. The mixture presented little of the fish-like odor, although it was distinctly perceptible. On arriving at the railroad station after a carriage drive of about half an hour, during which the mixture in the bottle was constantly agitated, the sample was found to present the nauseating odor in a high degree. This was again noted during the evening of the day of collection; the next morning it had somewhat diminished, and after this it rapidly disappeared, so that by the fourth day the water possessed only a strong pond-like odor. The bottle was glass stoppered, and it is difficult to explain the rapid loss of the odor.

A sample of the water which was used for filtering was found to contain 16 colonies of *Uroglena* and 208 individuals of *Dinobryon* per cubic centimeter. At the time of the experiment the water and air were cool, and the marked development of the odor in half an hour is not to be explained by ordinary putrefactive decomposition; the time was too short and the temperature conditions were unfavorable. Rather must we believe that the odor was due to some material excreted by the organisms or dissolved from them. If the odor associated with *Uroglena* is due to an excretion by these organisms, it should be present in the samples of reservoir water in which they are abundant in greater intensity than in the tap water in which they are few. On the other hand, if it is due to some substance contained in the organism it would be expected that the odor would be imparted by them, in some degree, to all waters in which they are numerous, but that it would become very much more marked when the organisms are broken up and their contents disseminated at once through the mass of water.

These are the conditions which have been found in the reservoirs and tap water under discussion and in the bottle experiment, and strongly indicate that with *Uroglena*, at least, the odorous principle is derived directly from the organisms, being especially marked when they are broken up. That this organism is destroyed by the pressure and rapid motion in the pipe is shown by their small number or entire absence in tap water, when they were abundant at the gatehouse, and indeed, their fragile structure would appear to make this a necessary result of any harsh treatment.

Regarding the other organisms above mentioned I may say that Mr. F. F. Forbes states* that the infusorium, *Uvella*, imparts a most disagreeable odor to water, 10 colonies per cubic centimeter rendering it unfit to drink, while even fewer will cause much complaint. He also states that the infusorium, *Dinobryon*, renders the water distasteful in numbers of 1,500 per cubic centimeter, and that 5,000 per cubic centimeter of the diatom, *Asterionella*, makes the water decidedly disagreeable with a strictly fishy odor. The alga, *Volvox*, was carefully studied by Mr. Geo. W. Rafter at the time of its occurrence in large quantities in the Rochester, N. Y., water supply in 1888. He concluded that the

* The Relative Taste and Odor Imparted to Water by some Algæ and Infusoria, Jour. N. E. Water Works Assn., Vol. VI, No. 2, 1891.

strong fishy odor there complained of was caused by the decomposition of the organisms in the pipes. He has shown that the odor was produced directly from the organisms by the following experiment.*

A large number of the organisms were concentrated into a small volume of water, by straining many gallons of water containing them through a bag. The mixture was filtered through paper, and the clear filtrate found to possess the strong odor, which it lost completely on warming, showing the presence of some volatile principle. The algæ were washed off the paper with distilled water, and this mixture was found to develop the odor on heating, showing that the odorous principle was extracted from the organisms, or formed from them in the act of heating. There was produced in the heating a quantity of brownish amorphous matter similar to that which was found in the water flowing from the pipes, although of course it could not have been a product of decay in the experiment. The observation shows for *Volvox* what has been shown for *Uroglena,* that the odor may be produced independently of putrefactive decomposition.

Mr. Forbes has charge of the Brookline, Mass., reservoir and has studied the organisms under most favorable conditions ; it is very much to be desired, that others having charge of our reservoirs should become interested in the study of the organisms occurring in them. For it is by the study of such observations as may be made at the reservoirs at favorable times, taken in connection with systematic biological and chemical examinations, that we may hope to determine what are the noxious forms, and the conditions favorable to their development, and thus be put in a position to discover the remedies.

* Trans. Am. Soc. of Civil Engineers, Vol. XXI, Dec., 1889, p. 499, On the Fresh Water Algæ and their Relation to the Purity of Public Water Supplies.

REPORTS OF THE MICROSCOPICAL EXAMINATIONS.

REPORT FOR 1889-90,

BY S. W. WILLISTON, M.D.

The report herewith submitted on the microscopical analyses of the potable waters of Connecticut comprises the result of twelve monthly examinations of the twelve different waters selected for the first year's work, beginning with August, 1889. My removal from Connecticut in August, of 1890, necessitated my withdrawal from the work, which was transferred to Dr. Thos. G. Lee, of the Yale Medical School, who assumed it in addition to that of the bacterial analyses. The second year's work, as explained by Dr. Lee in his report, included the examination of a part only, of those waters studied during the first year, in addition to a number of other waters. In order to make the report more concise, and enable conclusions to be more readily drawn, the two years' results have been united, so far as was practicable. For those waters of which there were made continuous examinations during the two years, the results are given together, those of the second year being printed in heavier type.

The methods employed are essentially those of the Massachusetts Board of Health, as devised by Professor Sedgwick, the biologist, to whom I am greatly indebted for the information freely imparted. They are as follows :

Of the ordinary waters, as collected for chemical or bacterial analyses, one hundred cubic centimeters are ordinarily used for an analysis, though, in some cases, twice that amount was required to give the best results, and, often a much less quantity was all that could be filtered well ; in some rare cases the unfiltered water itself was best observed.

In the bottom of an even-bored stem of a small glass funnel, a small pledget of absorbent cotton is introduced, upon which the filter-material, to the depth of three or four millimeters, is placed. In the early part of the work I used sand for the filter-material, as advised by the experts of the Massachusetts Board of Health, but later abandoned it for a precipitated silica, prepared for me by Professor Smith.

This material was prepared as follows: Silicon fluoride was evolved by heating equal quantities of powdered flour spar and white sand with strong sulphuric acid. The gas was passed into a large quantity of water, through a funnel dipping into the water, mouth down. The gelatinous silicic acid thus produced was filtered off and dried on the filter paper at a gentle heat.

This silica appears in thin, small, roughened scales, to a great extent transparent in thin layers. It was sifted through bolting-silk, in order to obtain particles of as nearly uniform size as was possible. The fine, light powder thus obtained was, for convenience sake, kept in a small vial with distilled water, in such proportion that a given quantity of the water and suspended material furnished the right quantity of filter material. From careful examination, I found this silica a closer filter than sand, and with the advantage that it distributes itself in the cell; its semi-transparency, also, permits a better examination of the entangled organisms. It filters not quite as readily as does sand.

The ruled cell was obtained from Professor Sedgwick, and is similar to the ones in use by the analysts of the Massachusetts Board,—a glass plate accurately ruled in square millimeters and surrounded by an oblong brass cell, twenty millimeters in width by fifty in length, and holding about two cubic centimeters of water.

After removal of the pledget of cotton, the silica or sand, with the accompanying organisms, is washed down into the cell with a little distilled or filtered water. After this material has been induced to distribute itself and settle, it is examined with the aid of a half-inch objective and C eye-piece, and the different organisms in a varying number of the squares counted, the number for the entire cell being thus estimated with considerable certainty. My more usual habit was to count each organism by itself; if occurring in large numbers, the average of perhaps a half dozen squares being sufficient to indicate the whole number; if, on the other hand, but few were observed, many more of the squares were examined. In most of the cases, however, in which but few organisms of any species were seen, I have preferred to represent their presence by an asterisk, rather than give a definite number, the accuracy of which is more doubtful. It is, of course, readily understood that the greater number of individuals present in a sample under examination, the closer will be the determination of the sum total based upon a part.

The method is not, in all respects, one of strict accuracy, but, properly used, it will meet all the demands of the present time. To Professor Sedgwick and his assistants much credit is due for its devisal. It, for the first time, permits a reasonable degree of certainty in the estimation of the relative abundance of different organisms, aside from bacteria, in water, and will place such examinations on a different plane from what they have hitherto occupied.

There are certain very important details, however, about which clearer methods are desirable. Thus, while it is the simplest matter to estimate the number of diatoms or desmids, or protococcids in a given quantity of water by actually counting a proportion of the frustules or cells, there is much less certainty in the determination of many others, and these others, often very important organisms, such as *Anabæna* and *Clathrocystis*. Here, to count the individual cells seems quite out of the question, and a filament or thallus is composed of a very variable number, due to the growth or decadence of the plant. The analyst may equalize his own analyses, so that they will give pretty faithful records of his own examinations, so far as the relative abundance is concerned, but they must necessarily be more or less at variance with the observations of others.

I must, also, add a word of caution. Filtering cannot be relied upon in all cases; indeed, in most cases, the unfiltered water also, should be examined. I have found the method to utterly fail in the examination of the most contaminated reservoir water that I have yet seen. Even the best filters available will not keep back the smallest cells, forms sometimes very abundant. The remarkable water of the Thomaston reservoir contains, during the summer months, incredible number of the smallest protococcus cells, and but little else. These cells I found scarcely less abundant in the water filtered through sand, silica or even filter paper, than in the unfiltered water. Nothing short of the direct examination of the water will give, in such cases, a truthful result. Fortunately, such forms in large numbers, are not common in potable waters.

For the benefit of those who cannot obtain the costly apparatus for the quantitative examination of specimens of water, I will give simpler methods which I have found to answer the purpose about as well. Mr. Rafter has already published similar modifications of the Sedgwick method, but I here give the results independently

reached by myself in 1890. I found that by using sand as the filter-material and washing it down, together with the entangled organisms, into a homœopathic vial, and then gently shaking the contents, the water, with the organisms, could be poured off with but little loss, but few of the plants and animals remaining with the sand. Upon a piece of clear glass a cell is made, square or oblong, with smooth walls, and deep enough to just permit the object glass to pass over it. Ordinary putty will answer the purpose, if nothing better is at hand. The dimensions of this cell are then obtained in lengths and breadths of an ordinary micrometer eye-piece, as seen through the lenses that the observer will use for analysis. By counting the organisms between the parallel lines of the micrometer, and multiplying by the ascertained dimensions, one may obtain a sufficiently accurate estimate of the contents of the cell, which, of course, represents the amount of water filtered.

So far as possible, the specimens of water for microscopical analyses have been obtained directly from the reservoirs or lakes. From repeated examinations, I have been convinced that no safe or reliable results can be expected from water that has passed through the mains, often under much pressure. So far as the diatoms and other hardy algæ are concerned, as well as many of the animal forms, but little difference is observed, it is true; but, with many forms, and they usually the more deleterious ones, the results obtained from faucet-water are not only faulty, but misleading. Many of the more delicate plants, and not a few of the animals, are entirely destroyed, or at least, partially broken up and disintegrated, by even a short passage through the pipes. As an example, it may be well to cite the case of the Meriden water contamination in October, 1889. During the latter part of that month, the people and authorities of Meriden became greatly alarmed at the condition of the water, as delivered through the faucets, its strong and disagreeable odor rendering its use extremely unpleasant, if not forbidding. At the same time, the water in the reservoir had its accustomed purity, when freshly taken. The cause of the trouble was naturally attributed to the improper management of the water supply, whereby decomposing material had carelessly been left to accumulate in the mains. The superintendent, in self-protection, obtained a sample of the water and sent it to us for examination. Nothing definite was learned from the analyses of the sample, and because of the

interest attached to the subject, I immediately visited Meriden to ascertain, if possible, the real cause. Specimens taken from the lake were immediately carried to the laboratory and examined, disclosing large numbers of the peculiarly delicate organism known as *Uroglena volvox*, which were, doubtless, largely, if not wholly the cause of the contamination. Not only did the passage through the mains destroy every trace of this organism, but they broke down and disappeared in a short time in the laboratory. *Clathrocystis*, one of the most troublesome of all the forms occurring in water, is almost invariably partially broken down by its passage through the mains. Some deleterious plants will show scarcely a trace in the tap-water, for the reason that they float in the reservoirs near the surface, while the water from the mains flows from greater depths. For these reasons, the waters from Stamford and Hartford have not given satisfactory results; all the other waters have been taken from the reservoirs or lakes.

From our analyses, it appears that the average number of organisms in the different reservoir waters varies only within moderate limits during the different seasons of the year; and that, while there is a perceptible decrease during the colder months of the year, the decrease is hardly what one would have expected. In the following table I have brought together all the analyses—nearly three hundred—in a way to show the approximate average of the principal types for the different months.

AVERAGE NUMBER OF ORGANISMS PER CUBIC CENTIMETER FOR ALL THE ANALYSES.

	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July
Diatomaceæ	77.3	65.5	116.	124.	72.	49.6	25.3	101.	106.	161.	75.1	220.
Cyanophyceæ	33.6	62.	9.9	2.3	.6	....	....	.5	.4	2.9	4.	15.
Desmidaceæ	5.8	3.6	.9	3.5	1.2	.8	.3	.1	.1	1.1	1.2	12.
Protococcaceæ	61.1	56.6	29.3	21.	6.5	10.	5.	9.3	7.5	33.5	68.8	42.
Rhizopoda	.1	.3	.9	2.	.7	.3	....	.5	.4	.4	.3	1.1
Rotifera	.1	.2	.1	.1	.1	.2	.2	.3	.7	.8	1.5	....
Infusoria	12.	5.9	5.9	123.	71.	49.	108.	57.	40.	8.2	32.5	26.
Totals	190.0	194.1	163.0	275.9	152.1	109.4	138.8	168.7	155.1	207.9	183.4	316.1

It must be understood that these results can be approximate only; it would require at least three thousand analyses to produce accurate results. A single and accidental increase of some

one organism, under peculiar circumstances, may appreciably vitiate the total. For this reason I have omitted the Protococcus forms of the Thomaston analyses. However, I believe the above to be sufficiently near the truth to indicate the seasonal effects upon the chief types.

It will be seen that the diatoms are most abundant in spring and autumn. This may be due to a greater prevalence of these plants at these times, or it may mean that the growth and decay of the higher algæ and other plants affect their conditions of growth, many of the forms being usually found attached to such plants.

No such explanation, however, can be given for the greater abundance of the Cyanophyceæ, or blue-green algæ, during the warmer seasons. These very deleterious forms are chiefly, if not wholly, wanting during the winter months, and steadily increase in abundance with the increasing temperature. The greatest number is shown in the table to occur in September, but this result is influenced by their extraordinary abundance in the Meriden water in that month. The figures scarcely indicate their numerical importance, for, as elsewhere stated, the numbers represent the separate filaments or groups, each of which may be composed of hundreds or thousands of separate cells. The life-histories of most of the members of this group are yet poorly known, or even wholly unknown, a fact much to be deplored, as it seems probable that our reservoirs will never be freed from the evils they cause until their habits are known. As late as 1885, Hansgirg (Biol. Centralblatt) expressed the opinion that *Anabæna*, *Sphærozyga* and the related forms were merely developmental stages of such plants as the *Oscillariæ*, *Rivulariaceæ*, etc. As regards *Clathrocystis* and the allied protophytes, "it is highly probable that many forms at present included in the family are stages in the development of more highly organized protophytes, or even of algæ" (Bennet and Murray, Crypt. Botany, p. 448). Could this latter supposition be rendered certain, we would, probably, quickly find the remedy for their evils. Both *Anabæna* and *Clathrocystis* float near the surface of the water, and cannot themselves at present be successfully attacked. It is a little curious that, in the Middletown reservoir, while both *Anabæna* and *Clathrocystis* were abundant, dredging showed immense quantities of a *Conferva*. "According to some observers, many of the species of Confervaceæ are connected genetically with

forms at present placed under the Protophytæ." (Bennet and Murray, *op. cit.*, p. 276.)

The seasonal distribution of the Desmidaceæ and Protococcaceæ is not different from that of the blue-green algæ. While they are found throughout the year, it is only during the warm weather that they become abundant. The Desmids are unimportant, save perhaps as indicating the general character of the reservoir or pond whence they came. Although of considerable size as compared with the other more common algæ, they are usually few in number, and it is generally only the smaller forms that are the more common. The Protococcids are all very minute, and it is seldom, I think, that they will be found troublesome in the ordinary reservoir. A careful search will probably disclose them in all reservoir waters at all times, though often in such small numbers that they may be readily overlooked. In water drawn from the faucet they are less common. They will usually grow readily in ordinary pond water, when kept in a warm place; indeed, one can scarcely keep impure water in an open receptacle exposed to the sun, without its becoming filled with them. Perhaps the readiest way to demonstrate this is to place an uncorked vial filled with urine in the window. After the urine has become broken down into its inorganic elements, some floating protococcid cell is sure to find lodgment in it, increasing rapidly till the water is green with them. There is not a little doubt still existing among students of these forms as to their true nature, many believing that they are merely the early stages of higher algæ. Be that as it may, there must be some peculiar reason for their extraordinary abundance in the Thomaston water during some summers. The water, as received in September, 1889, showed a decided greenish tinge, and the unfiltered water gave the enormous number of nearly two hundred thousand organisms in the cubic centimeter, or nearly one hundred million in an ordinary glassful of the water! The variety is smaller than the common *Protococcus viridis*, which forms the green coloring matter on the shady sides of trees and houses.

Of the Rhizopoda and Rotifera little can be said. Of the former, one or two species of *Difflugia* and the delicate *Actinophrys* were widely distributed, though not at all common. Of the Rotifera, *Anuræa cochlearis* and *Notholca longispina* were practically all of any importance. Both of these, however, are large forms, and always seem to indicate an impure water.

The Infusoria are far more common, often very minute, very variable in their structure, and comprise among them perhaps the most deleterious of any single type of life in the waters examined. Some of the very minute and less common forms have probably escaped our attention, and there may be some objections to our collocation of such genera as *Eudorina*, *Volvox* and *Pandorina* among them. Of the larger, more common, and possibly deleterious forms, *Peridineum* and *Ceratium* are the most noteworthy. *Peridineum* was at times very abundant, considering its large size. It is said to occur in European ponds at times so abundantly as to color the water brownish. The most abundant and injurious forms, however, are found among the flagellate Infusoria, and, of these, none will compare with *Uroglena*. It will be observed that the Infusoria are most abundant during the colder months. This result of our analyses is chiefly due to the prevalence of *Dinobryon* during this season. These little creatures are very minute and extremely delicate. They are found in colonies, each within the cavity of an elongate, trumpet-shaped expansion, attached by a slender stem, one within another, in pairs. The minute animal itself is easily dislodged and decomposed.

On a preceding page I have briefly related the account of the remarkable outbreak of *Uroglena* in the Meriden reservoir, in October, 1889. From the great interest which bids fair to be attached to this organism, I may be permitted to dwell more at length upon it. In my first determination of the organism I referred it to *Volvox*, a plant or animal that has, in various places, been accredited with producing similar results, and with which, indeed, the *Uroglena* itself was, for a long time, confounded. A little later, however, I was led by its extreme delicacy to refer it to *Uroglena*, a conclusion further substantiated by the receipt of a letter from Professor Conn, of Middletown, who also identified the organism which had, a short time previously, produced a similar contamination in the Middletown reservoir, as *Uroglena*. In the March number of the "Microscope" for 1890, I published a brief note of the occurrence of this organism at Meriden, and asked for further information concerning its habits. In reply to this, I received a letter from Mr. G. C. Whipple, analyst to the Boston Water-works, stating that he recognized the form in a small pond near Boston. Within the past few weeks Mr. Whipple has again written to me con-

cerning it, from whose letter I take the liberty of making the following quotations: "The town of Norwood, Mass., is now suffering from *Uroglena*, which has appeared in Buckmaster Pond, and is found immediately below the ice. The pond is a small one of about twenty-five acres, and is about thirteen feet average depth, although deeper in places. At one end there is an extensive mud bottom; elsewhere it is sandy. In our own supply, or rather in a pond (Whitehall Pond) which will one day be connected with our supply, we had a very bad attack last June. The oily, fishy smell was almost unbearable at times. *Uroglena* was present in enormous numbers. This pond has a large area of shallow flowage. Plymouth, Mass., also, is now enjoying *Uroglena*."

From the foregoing, it will be seen that this organism bids fair to assume an interest scarely second to that of any other in the reservoirs. I cannot learn that the genus has ever before been recognized in this country, and but very little seems to be known of it in Europe. That this infusorian is a new one to our waters, is of course wholly improbable, and the question remains whether the troubles hitherto imputed to *Volvox* are not in part due to *Uroglena*.

Because of its importance, I herewith give a rather full quotation from Kent's Manual of the Infusoria, as follows:

"UROGLENA.—Animalcules inclosed socially within a subsphæroidal gelatinous matrix, or zoocytium, to the center or deeper substance of which they are united through the medium of slender, thread-like, highly contractile, posteriorly developed prolongations; in their normal or extended condition the anterior borders of the individual animalcules impinging upon or slightly projecting beyond the periphery of the zoocytium, but capable at will, through the contractions of the filiform posterior prolongations, or pedicles, of being withdrawn entirely within its substance; flagella two in number, of diverse size; endoplasm enclosing two distinct lateral color bands, and usually one or more eye-like pigment spots. Inhabiting fresh water.

"This type, in common with *Syncrypta*, *Synura*, and other socially aggregated Chloromonadidæ, has been usually regarded as a doubtful form probably representing an imperfect or transitional condition only of the protophytes *Volvox* or *Sphærosira* Quite recently, however, it has been shown by both Bütschli and Stein, to be an independent organism exhibiting, with relation to

the form and characters of the individual zooids, an entire conformance with the several other generic types comprised in the Chrysomonadidæ.

"Among the data observed by the author with reference to the reproductive phenomena, it has to be recorded that zooids were abundantly found withdrawn into the common matrix or zoocytium, devoid of flagella, and presenting every step of gradation from a simply quiescent but non-encapsuled stage up to subdivision into two, four, or eight sphæroidal segment masses or sporular elements. These spores becoming distributed throughout this common gelatinous matrix, speedily acquire the adult forms and characters and are in most instances provided with the two lateral color-bands and eye-like pigment-spots at or immediately succeeding their earliest appearance.

"In the majority of the specimens examined this mode of reproduction was alone observed. Not unfrequently, however, examples were met with which enclose supplementary sphæroidal structures, having a diameter of two or three times that of the bodies of the adult zooids. On making a closer investigation it was found that these supplementary structures consisted of aggregations of spore-like bodies contained within a hard and glass-like transparent membrane or sporocyst, which exhibited its brittle consistence by rupture under artificial pressure into a number of angular fragments. The sporular elements thus liberated from their indurated capsules were found to possess two entirely distinct dimensions, being in the one instance, of comparatively large size, the $\frac{1}{6000}$ of an inch in diameter, while in the second case they did not exceed the $\frac{1}{20000}$ of an inch. Not improbably, however, these smaller sporular bodies represent a further segmented phase only of the larger ones, and in both instances they are so minute as to merit the designation of microspores in contradistinction to that of macrospores, which may be appropriately applied to the structures derived from the simple segmentation into two, four, or eight sporular elements of the ordinary unencapsuled zooids, as previously described. The precise import of these encapsuled sporular elements has not yet been determined; but from the proportionate size of their investing sporocysts it may be consistently predicted that they were primarily derived through the conjugation or genetic union of two or more ordinary zooids, while their encapsuled state would seem further to denote that surviving the disintegration

of the parent colonies, and probably the drying up of the water with the summer drouth, they secure the permanent preservation of the species.

"From *Volvox*, *Syncrypta*, *Synura*, and various other free floating animal and vegetable Flagellate types, for which the colony-stock of *Uroglena volvox* are somewhat liable to be mistaken, an easily recognized superficial feature of distinction is afforded by the general contour of the colony masses, which rarely exhibit that perfect spherical symmetry which characterizes the several first named forms."

Two modes of propagation are thus seen to occur, the more usual one of simple fission, similar to that of many algæ, and the less common one of sexual conjugation and microspore. As the author states, the latter method seems to be a provision for propagation out of water, the very minute, dried spores retaining their vitality and doubtless being transported by the winds. In the latter case, it seems not at all unlikely that any reservoir which presents the proper conditions for their growth may readily become infected by their spores. Apparently no season of the year is exempt from them, as Mr. Whipple's letter shows. As already stated, *Dinobryon*, an organism closely allied to the present one, is very common in winter, and probably finds ready growth at any other season. I am not aware that this latter infusorian has been productive of evil results, but one may imagine that such may be the case. Like *Uroglena*, the zoocytium, rapidly goes to pieces under changed conditions. The evil caused by *Uroglena* seems out of all proportion to their size and numbers. While the water was very bad in the Meriden supply, they numbered scarcely more than twenty to the cubic centimeter of water, each zoocytium being composed of about six hundred zooids. Further, they seem to make but little impression on the chemical analyses; the evil consists chiefly in the very disagreeable odor that their decomposition produces.

Mr. Whipple has succeeded in making photographs of *Uroglena*, and it is much to be desired that he may succeed in tracing their life-history.

Sponge spicules were observed in very few case; whether sponges were actually present in quantities in any of the reservoirs I cannot say, certainly we found no evidence of their evil results in the samples sent us. Again, too, the fungi *Leptothrix* and *Crenothrix* were very rarely observed. That these were

present in or about some of the reservoirs was certain, as, especially in the Middletown reservoir, the pools formed by the seepage through the sustaining embankment were filled with the rust-colored fungi. From their very habits, we would not expect these plants to be found in abundance in the open reservoirs; they must be sought in the tap-water.

Of the Crustacea, I am not sure that I determined a single other form than *Cyclops*, and this one usually in its adult condition. Owing to their large size and small numbers, as well as their active habits under the microscope, the tabular analyses will show but little. A better idea of their prevalence will be obtained from the number of times they were seen in the different months, as follows:

Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July
5	3	2	3	2	1	1	2	2	5	6	7

They were most numerous in the Middletown reservoir, in June.

It will be seen that comparatively few of the filamentous algæ are recorded; doubtless if the water had been taken from the faucet a larger number would have been disclosed.

In conclusion, it may be interesting to observe that, on the average, about seven thousand plants and animals, aside from the bacteria, are swallowed with every glassful of Connecticut reservoir water that is drank!

REPORT FOR 1890-91,

By Thomas G. Lee, M.D.

The methods used by me in the examinations of the various organisms were the same as those described in detail in the report by Dr. Williston. Great care was taken to have the conditions attending the collection and examination of the samples as uniform as possible during the whole period of two years.

The results thus obtained have been arranged in the form of tables. In all cases in which the observations extended through the whole period of two years, the results obtained during the second year are arranged immediately below those obtained by Dr. Williston for the corresponding months of the preceding year.

We have arranged the tables under the names of the cities or water supplies which they represent—one showing the number of organisms found each month, arranged generically, the other giving a summary of the results, as arranged in larger groups. In the generic tables, the genera of each group have been so arranged as to better exhibit their natural relationships, an arrangement in many respects preferable to a merely alphabetical one. The classification adopted is that given by Kirchner and Blochmann.*

It will be seen from an examination of the results of our examinations, as shown in the tables, that the vegetable forms are more numerous than the animal forms, both in number of genera and of individuals; and that the genera containing the greater number of individuals recur from year to year, at about the same times, and in relatively similar numbers. Other genera, however, as a rule not numerous in individuals, nor of frequent occurrence, may be present one year and absent the corresponding month of the next year, or even absent altogether.

As has been elsewhere stated in this report, similar investigations regarding the water-supplies have been carried on by the Massachusetts Board of Health, for several years.

In a recent report, Dr. G. H. Parker† gives the results obtained by him in a series of monthly observations upon certain of the water-supplies of Massachusetts, covering a period of two years, from July, 1887, to June, 1889. His results are very interesting, in this connection, in that they cover a period of time immediately preceding that of the present reports, and in a region in immediate proximity to our own. If we combine the reports, we have continuous monthly examinations, observations for a period of four years in regions separated by no marked differences in the geological or climatic conditions, which might affect the character or number of the organisms. It is, consequently, interesting to note the general correspondence in the results obtained. Very many of the genera found by Parker, in all the different groups,

* Die mikroskopische Pflanzen und Thierwelt des Suesswassers, von O. Kirchner und F. Blochmann, bevorwortet von O. Buetschli, Braunschweig, 1885–'86.

† Report upon the Organisms, excepting the Bacteria, found in the State, July 1887, to June 1889, by G. H. Parker, Biologist. Report of the Massachusetts State Board of Health on Water-supply and Sewage for 1887–'90, Part I, Boston, 1890, p. 581.

in Massachusetts, have been observed by ourselves. For example, among the more frequently noted and important genera, found in both States are: *Anabæna* and *Clathrocystis*, among the Cyanophyceæ; *Asterionella*, *Tabellaria*, and *Synedra*, in the Diatomaceæ; *Staurastrum*, *Pediastrum*, *Rhaphidium*, *Scenedesmus*, and others, among the other algæ; while *Dinobryon*, *Peridineum*, *Trachelomonas* and *Anuræa*, are among the more frequent forms of animal life. Of the genera less frequently noted and occurring in smaller numbers, observed by both Parker and ourselves may be mentioned *Conferva*, *Polyedrium*, *Closterium*, *Cosmarium*, *Navicula* and *Comphonema*, among the vegetable forms, and *Actinophrys*, *Difflugia*, *Ceratium*, *Euglena*, *Eudorina*, *Pandorina*, *Volvox* and *Cyclops*, among the animal organisms.

REPORT ON THE BACTERIOLOGICAL EXAMINATIONS.

By Thomas G. Lee, M.D.

The collection of the samples of water for the bacteriological examinations was not an easy matter, as the water supplies were located in different parts of the State at considerable distances from New Haven. This being the case it was necessary to ship the bottles monthly to some person at the source of supply, who would use great care in filling them and immediately re-shipping them to the laboratory. These collectors—in many cases the superintendents of the water works—were also given detailed instructions as to the manner of collecting the samples and the precautions to be observed by a personal visit to each. During the course of this investigation the following circular was sent with each box of bottles :

Instructions for Collecting Samples of Water for Bacteriological Analysis.

1. *From a Tap.*—Let the water run freely from the tap for a few minutes before collecting, carefully remove the rubber cap, and place the *stoppered* bottle under the tap, rinse the outside thoroughly, then remove the stopper, and as soon as the bottle is filled, replace the glass stopper and cover again with rubber cap as soon as possible, remove excess of moisture from the outside of bottle and return to case.

2. *From a Reservoir, Stream or Pond.*—Remove the rubber cap, submerge the *stoppered* bottle to the depth of twelve inches, remove the stopper and replace as soon as bottle is filed, cap at once, drain and return to case.

IMPORTANT.

1. The temperature of the water is to be taken at the time the sample is collected, and noted.

2. Under *no* circumstances must the inside of the bottle or stem of stopper be touched by the hand ; nor should the bottle be allowed to remain open.

3. It is very important in collecting samples from ponds or reservoirs, that they *shall be free from the sediment* on the bottom and from the *scum* on the surface.

4. The *ice chamber* of the *sample case* is to be *filled* with pieces of *ice wrapped in cotton batting*, which will be found in case. This must be *done before collecting* the sample of water.

5. The sample must be *shipped as soon as possible* after collecting, so that as little time as possible shall intervene between the collection of sample and its examination.

6. The accompanying *certificate* must be filled out carefully and enclosed in the envelope shipping tag.

The outfit for shipment consisted of a galvanized iron box with a hinged cover and fastened with a shawl strap to enable it to be easily carried. The box contained a central compartment subdivided so as to hold snugly six bottles ; the remainder of the box formed an ice chamber. This metal box was fitted with an outside wooden case with a hole in the cover through which the shawl strap handle protruded and to which was fastened the envelope of instructions. This envelope contained a return envelope, the circular given above, and a blank upon which the collector was to enter the date and hour of collections, temperature of water and air, and the hour of shipment by express. The bottles used were wide-mouthed glass stoppered bottles of about 200 c.c. capacity. These were each time carefully washed and dried and then sterilized by being heated in an oven at a temperature of 150°–160° C. for thirty to forty-five minutes. After cooling, the stoppers were covered with large rubber caps, which fitted tightly around the necks of the bottles. These caps also were each time carefully washed and rinsed with sterilized distilled water.

Wherever possible, the samples of water were taken from the source of water supply near the gate house, but this was not in all cases possible, and they were then taken from a tap in pumping station or near by. If taken from the reservoir the bottle was opened and closed under the surface of the water ; if from the tap the water was allowed to run long enough to empty the pipes and the bottles opened and closed under the stream of running water ; in this way the danger of outside organisms obtaining entrance into the bottles was greatly reduced.

The boxes were sent to the collectors some little time in advance of the date of collection so that there should be as little variation as possible in the time each month when the sample was obtained. Upon receipt of the boxes at the laboratory a gelatine plate culture was made for each bottle. These cultures were made by the well known Koch method, which has been described in detail in previous reports of the State Board of Health, and which consists in brief of the following: A tube of sterilized peptone gelatine is liquefied, and to it is added 1 c.c. of water from one of the bottles. After being well mixed the whole is poured upon a sterilized glass plate and placed in a glass chamber which has also been sterilized; a glass bench is placed over this and another prepared plate, and in this way by alternating plates and benches several can be kept in a single glass chamber. In the course of a day or so an examination of the plate with a hand lens will show the presence of a number of small usually whitish specks. Each of these specks consists of a colony produced from a single organism originally present in the water. By an enumeration of the colonies on the plate we are able to compute the number of bacteria in a given quantity of water. This method not only enables one to rapidly count the number of organisms in a sample of water but renders easier a more detailed examination of the forms of organisms present. This was the method used in present investigation; in some cases, however, instead of using a large chamber with several plates smaller sterilized glass chambers were used, into which were poured the liquefied gelatine after the addition of the water to be examined. The colonies which make their appearance as whitish specks for the most part rapidly increase in size and begin to assume more or less characteristic appearances. As they grow they either liquefy the gelatine, forming rounded pits which as they increase in size fuse with neighboring ones, or they may belong to the solid forms, and grow as rounded or irregular elevations upon the surface of the gelatine. These colonies again are frequently colored as they increase in size, being white, red, yellow, blue or fluorescent, etc. These more or less characteristic surface appearances enable one to determine from the appearance of the plate approximately the number of forms present, but is not in itself sufficiently accurate to determine the species in every case; as, for example, certain forms may remain solid for some time and later liquefy; others may when first seen

be white and later of some other color and may give rise to various shapes before they assume the really characteristic one; and as these changes require some time, the plate in the meantime may be ruined by the liquefaction of the gelatine from the rapid growth of certain other forms.

The great similarity in size and form of certain species of bacteria as seen under the microscope increases the difficulty of readily determining between different species without other corroborative tests. As a consequence of all this in order to determine in a positive manner the species which may be present in the plate under examination, it is necessary to make pure cultures by isolation methods, and to note carefully all the changes which they undergo when cultivated on various nutrient media, as nutrient agar-agar, potato, gelatine tube cultures, bouillon, together with observations as to whether they are motile or non-motile, possess the power of or of not liquefying gelatine, noting their reactions with various staining fluids, size, form, whether they produce bubbles of gas, or can live when deprived of oxygen, and finally by a comparative study of all these and other phenomena we arrive at a positive determination of species. These processes consume considerable time, often many days, even weeks, and it will be readily understood could not be applied to each of the several hundred plates examined. At my suggestion Dr. Charles J. Foote undertook a careful and detailed biological examination of the most characteristic forms present in the waters under examination. The results of Dr. Foote's observations will be given in a report following this in which will be detailed the methods used and a description of the forms observed.

All data relating to the amount of rainfall, temperature of the air and water, at the location of these water supplies, that could be procured are given in the tables. It is much to be regretted that no records of this kind were obtainable at certain reservoirs.

The tables and notes give the results obtained each month at the various reservoirs during the time of investigation, and certain of the results thus obtained are elsewhere given in a graphic manner in the charts.

In the tables, the word solid as used in describing colonies of bacteria is intended to signify non-liquefying growths as contrasted with those which render the gelatine fluid.

To secure greater accuracy in the monthly mean temperature and rainfall for those reservoirs, as Norwich and New Haven,

from which samples were collected on the 10th of the month, the records were taken for the date of one collection to the next, i. e. (10th–10th) and not the mean of the month itself.

As will be seen by an examination of these tables and the corresponding charts, there is a more or less prominent monthly variation in the number of bacteria present. This variation is to be noted between different reservoirs and at different seasons in the same reservoirs. Again there is a difference between the results obtained in corresponding months from one year to the next. That there should be a variation from month to month was to be expected, and to ascertain the range of these variations during a considerable period of time was one of the principal objects of this investigation. A careful study of these results shows, however, that there is a considerable uniformity between the two years in corresponding seasons, and that the periods of greatest numbers were principally during the fall months, while the smaller numbers were largely during the summer months. During 1889–'90 half the reservoirs reaching their maximum number during September, October and November, and in 1890–'91 a still larger number or two-thirds the reservoirs reaching their highest point, while on the other hand half the minimum results were obtained during the summer months, the others occurring at various times during winter and spring.

If now we examine the changes from month to month we find that then there is an almost universal increase in numbers in September over August in both years; this increase in numbers will be seen in the majority of the reservoirs during October and in 1889–'90 in November. In 1890–'91 there seems to be a general falling off to increase again somewhat in December, as also in several in 1889–'90 during the same month. During January in both years there was a decrease; this was continued during February and March, though in March, 1890–'91, there was an increase in several of the reservoirs. The numbers will be seen to increase gradually during April, May and June, to again decrease somewhat during July and August, 1890.

The organisms found in these water supplies are saprophytic bacteria, and as far as known, not harmful to man. Their presence in the water is largely connected with the amount of organic matter present in solution, which forms their food. The total number of species found is not large as compared with the results obtained in many other water supplies. The number of individ-

uals per c.c. from a few species, if very large, is a bad indication, but would not be necessarily as suspicious a circumstance as the presence of a large number of species.

Many of the species of bacteria were widely distributed over the various water supplies, and also of quite constant occurrence from month to month. Liquefying (putrefactive) bacteria were very constantly present, but in varying numbers, and not representing many species. Judged by the bacteriological investigations, the water in the majority of the reservoirs is fairly good and unquestionably would be much improved by the exercising of greater care in preventing the growth of plants and in removing those which have accumulated. A water supply should not be judged merely by one kind of examination, but the results of the microscopical, chemical, and bacteriological tests should be combined in deciding on its grade as a potable water.

A DESCRIPTION OF SOME BACTERIA FOUND IN CONNECTICUT WATER.

By Charles J. Foote, M.D.

In the following pages the writer has described sixteen of the bacteria most common in Connecticut water. The description explains largely the method of study. The bacteria which were most striking and abundant were selected from each gelatine plate made, and their method of growth on gelatine plates and in tube cultures, on agar, on potato and in bouillon, studied: as well as the microscopic appearances of the colonies and of the bacteria themselves. The experiments were performed at the temperature of the laboratory, which varied considerably, but was most of the time between 60° F. and 65° F. The bacteria were studied in the late fall and winter, consequently the forms described were such as are found at those periods of the year. It was particularly noticeable that the purple pigment bacteria were most common in the coldest weather. The locality where each variety of bacteria was most abundant was noted as follows:

No. I, Waterbury; No. II, Hartford; No. III, Hartford; No. IV, Hartford; No. V, Hartford; No. XI, Waterbury; No. XII, Hartford; No. XIII, Hartford; No. XIV, Middletown; No. XXI, Norwich; No. XXII, Norwich; No. XXVI, Stamford; No. XXVII, Waterbury; No. XXXI, Waterbury; No. XXXII, Waterbury; No. XXXIII, Stamford.

The following classification has been made to facilitate the recognition of the bacteria described. Several bacteria have been classified as liquefying which only liquefy very slowly and which at first only excavate the gelatine without liquefying it. Following this classification is a scheme for diagnosing the green liquefying bacteria, first in plate cultures and then in tube cultures. Some of the forms described are well known, such as the bacillus subtilis and the bacillus violaceous, and it is quite possible that some of the forms have been noted by Rosenberg, Frankland and others. No attempt at identification has, however, been made since the data in most cases seemed insufficient to warrant it. Other well known forms were occasionally seen, such as the bacillus ramosus and gas forming bacillus.

CLASSIFICATION OF WATER BACTERIA.

A. Green Fluorescent Liquefying Bacteria.
- I.
- II.
- III.
- IV.
- V.

B. Liquefying Bacteria not Producing a Green Fluorescence.
- (*a.*) Producing no Pigment.
  - XI.
  - XII.
  - XIII.
  - XIV.
- (*b.*) Producing Purple Pigment.
  - XXI.
  - XXII.
- (*c.*) Producing Brown or Yellow Pigment.
  - XXVI.
  - XXVII.

C. Non-liquefying Bacteria.
- XXXI.
- XXXII.
- XXXIII.

SCHEME FOR DIAGNOSING GREEN LIQUEFYING BACTERIA BY COLONIES OF PLATE CULTURES.

Colonies round and well defined from the first.	Round, apparently solid, opaque, convex colonies; no signs of liquefaction for several days. No. II.
	In early stages a white dot in the centre surrounded by a transparent zone. No. V.
	Young colonies have no peripheral liquid transparent zone. No. IV.
Colonies first have a transparent outer zone with an irregular or crenated border. Later the colonies become round and the transparent zone becomes liquid.	After two days' growth, the colonies are flat and show no signs of depression in the gelatine, or liquefaction. No. III.
	After two days' growth, a depression appears in the centre of the colony about the size of a small pin head filled with semi-solid dirty white matter. No. I.

SCHEME FOR DIAGNOSING GREEN FLUORESCENT LIQUEFYING BACTERIA BY GELATINE TUBE CULTURES.

- Liquid Gelatine cloudy.
  - No. II. Liquefies slowly—liquefaction first only at the extreme upper part of the line of inoculation.
  - No. V. Liquefies rapidly. Liquefaction from the first through the whole length of the line of inoculation.
- Liquid Gelatine clear.
  - A pellicle forms on the surface of the liquefied gelatine.
    - No. III. No. I. Liquefaction proceeds downward on a horizontal level. A thick greenish white pellicle forms on the surface. These two are distinguished microscopically and by plate cultures.
  - No pellicle on the surface of the liquefied gelatine.
    - No. IV. Rapid growth. Liquefaction proceeds in a funnel shape. Granular white precipitate shape of inverted cone. Fair growth along line of inoculation.

No. I. This appears on the gelatine plate, after two days, and presents a dirty white irregular center which is liquid and depressed. Radiating from this center are lines. The zone surrounding the center is almost transparent, bluish-white, superficial and solid. While this description applies to most of the colonies, sometimes there is considerable variation, some of them have the same center as above described, but radiating from this center are feathery-gray filaments, almost resembling a mould.

The colonies grow rapidly, and after twenty-four hours more than double in diameter, so that when the plate is three days old the colonies are fully one-half inch in diameter. They are then round with a sharply defined outline, and green liquid contents. The liquid contents sometimes have a buff colored skin with a downy border floating on them, or sometimes an opaque white dot in the center, around which are white flocculi with a tendency to an arrangement in radiating lines. The central portion of each colony usually is a thick skin which can be pierced with a needle and has sufficient toughness to retain the perforation several days. The colonies give out a very marked odor of

putrefaction. Examining the colonies with a one-half inch objective we find that the young ones appear merely as round homogeneous yellow disks. When the colony gets older it becomes differentiated into two portions, consisting of a dark brown central area with a worm-eaten appearance, and outside of this a broad white waxy zone with a fluted appearance. The outline of the latter zone is irregular and the boundary between the two portions of the colony is well marked.

When grown in a gelatine tube culture, a clear silvery bubble about one-eighth inch in diameter, appears after three days on the surface of the gelatine. There is also a marked growth along the line of inoculation. One day later the bubble has extended rapidly over the surface, so that now it is nearly one-half inch in diameter. The silvery appearance given to the bubble is due to a thick white pellicle. Below the bubble the gelatine is liquefied in the shape of a cup and this liquefied area is markedly green. Six days from the date of inoculation the bubble has disappeared and the gelatine has been liquefied for about one inch in depth. The surface of the liquefied gelatine is covered with a thick flocculent greenish-white pellicle. The liquid gelatine itself is a transparent green. Dividing the liquid gelatine from the solid, below, is a flocculent white precipitate. The solid gelatine is not colored.

This bacterium grows rapidly on agar, after three days showing an abundant white superficial growth, coloring the agar a beautiful green. It likewise grows rapidly on potato and forms a granular, irregular bordered yellowish-white mass, not confined to the line of inoculation. The growth is dry and coarsely granular. A month or so later the granular appearance disappears, and the growth is smooth gelatinous and yellowish. When grown in milk, it turns it slightly acid, and precipitates the casein. Over the precipitate floats a greenish watery fluid. A foul odor is given off. It grows well in bouillon forming a thick white pellicle on the surface and coloring the upper portion of the liquid green. Under a one-twelfth oil immersion objective, medium sized bacilli in active motion are seen. The bacilli are usually single, straight rods, and stain well with methyl blue.

No. II. This bacterium grows more slowly than No. I. After five days, however, colonies have developed, many of which are one-eighth of an inch in diameter. The colonies are greenish-white, solid, opaque, homogeneous, with regular round outline

and a convex surface. Examined under a two-thirds objective, the colony has a dirty clay-colored, homogeneous, opaque central area which gradually blends into a zone which has a pale yellow color and a finely granular, or, in some cases, a wrinkled appearance. The border is well defined and fairly regular.

Grown in gelatine tube culture, a bubble forms after three days on the surface of the gelatine, the lower part of which is covered by a white pellicle. Just below the bubble is a green liquefied area. The neighboring gelatine is colored a deep green. There is a slight growth along the track of the needle. Two days later the bubble has grown superficially rapidly, undermining the gelatine, and has reached the glass of the test tube. The gelatine has been completely liquefied for one-half an inch below the surface and the liquefied portion is very cloudy and has a green color. A fine white precipitate covers the surface of the solid gelatine. At the expiration of twelve days from the date of inoculation the gelatine has been liquefied nearly an inch from the surface. The liquefied area is green, cloudy, and opaque. A precipitate of greenish-white flocculi has settled down upon the solid gelatine. A thin greenish-white pellicle floats on the surface made up of concentric rings of flocculent matter. There is only a very slight growth along what is left of the line of inoculation.

It grows rapidly on agar presenting a smooth white opaque surface. The agar is colored a beautiful green. It grows rapidly on potato producing a brown slimy growth composed of confluent globular masses about the size of a pin head. It grows well in bouillon making it uniformly cloudy and turning it a green color near the surface.

Under an one-twelfth oil immersion objective we see short bacilli, sometimes single and sometimes in pairs (end to end) in active motion. The bacilli stain well with methyl blue.

No. III. This appears on gelatine plates after two days as a white round dot depressed below the surface of the gelatine, evidently liquefying it, or as a small superficial solid flat colony, almost translucent with a white dot in the centre and an irregular border. A day later all the colonies show a saucer-shaped depression in the gelatine, even those which previously appeared solid. At this time the colonies still present two forms, one a bluish almost transparent colony with a white dot in the centre from which radiate faint furrows; the border of this colony is

inclined to be crenated. Another, a round regular liquid colony containing a central greenish-white opaque flocculent area, outside of which is a clear zone of green liquid gelatine. Each of these colonies are nearly one-quarter of an inch in diameter.

When the colonies are five days old, they are often one-half inch in diameter. All the colonies are round with liquid contents, but in some of them the liquid contents is uniformly cloudy, and in others there are concentric rings of flocculent matter floating in clear liquid gelatine.

Examined under an one-half inch objective, some colonies appear round with a white fleecy peripheral zone and a light brown central area, while others have a very irregular outline with a pale white waxy peripheral zone and a central yellowish area. Grown in a gelatine tube culture, after three days a bubble appears on the surface of the gelatine growing rapidly, its lower surface covered with a white pellicle below which is a clear green liquid area with a few white flocculi at the bottom of it. Four days later the gelatine has been completely liquefied for about one inch from the surface. The liquid gelatine is a clear green and is covered with a thick greenish white pellicle. A thin horizontal layer of white flocculent matter divides the solid from the liquid gelatine. There is only a very slight growth along the line of inoculation. After eleven days from the date of inoculation there is no very marked change from the previous description, except that the gelatine is progressively liquefied, the flocculent precipitate somewhat thicker and the greenish-white pellicle not so marked.

This bacterium grows rapidly on agar, forming greenish-white, slimy pellicle, not spreading far from the line of inoculation. The outline is smooth and regular. The agar is colored green.

It presents large buff-colored dry masses on potato. On the moister portions of the potato, the masses are slimy.

It grows well in bouillon after three days forming a faint white cloud just at the surface of the liquid, below this the bouillon is clear. A week later the bouillon has become uniformly cloudy and is colored green near the surface.

A drop of the bouillon culture under an one-twelfth oil-immersion objective shows fine bacilli in active motion. The bacilli are often matted together lying side by side, but are not found in strings end to end. The bacilli only stain faintly with methyl blue.

No. IV. Colonies of this bacterium appear after two days on a gelatine plate as round white dots depressed below the surface of the gelatine and apparently liquefying it. A day later the colonies are an eighth of an inch in diameter and there is a saucer-shaped depression in the gelatine over the area of growth. The colonies are round with well defined outline and liquid contents. Some colonies have a white dot in the centre bounded by a narrow transparent zone and outside of this are opaque zone; others are similar to this except there is no transparent zone, but the colony is uniformly cloudy.

When the colonies are five days old they are about one-half an inch in diameter, and consist of green liquid gelatine containing a dense greenish white flocculent central area, bounded by a transparent zone; in some cases this transparent zone is bounded by another opaque flocculent zone. Sometimes the colonies are round with well defined outline and liquid contents, consisting of a faintly flocculent almost transparent liquid, and having a white dot in the centre. Examined under an one-half inch objective, the colonies show a faint, regular outline, a pale white peripheral zone and a central brownish area, having at times a wrinkled appearance. As the colonies grow older, inside of the pale white peripheral zone a furry zone develops and inside of this we still find a brown central area.

In tube cultures at the end of three days we find the gelatine excavated in the shape of a saucer. A bubble which formed on the surface has grown rapidly. The bottom of this bubble is covered with a ragged greenish white pellicle; below the pellicle is a green liquid, slightly flocculent area. There is a fairly good growth along the line of inoculation. When the tube cultures are seven days old, the gelatine has been liquefied for nearly an inch from the surface. Liquefaction progresses in a funnel-shaped manner. The superficial layers of liquefied gelatine are a deep green color and somewhat cloudy; the deeper layers are clear and not so deep green. Dividing the liquid gelatine from the solid is a funnel-shaped mass of white flocculent matter. No pellicle floats on the surface of the liquid gelatine.

At the expiration of two weeks from the date of inoculation, the liquefaction of the gelatine has proceeded much the same as above described except that the liquefied gelatine is clear with here and there a few white flocculi.

This bacterium grows rapidly on agar, as an opaque white pellicle with a slightly irregular outline. The agar is colored green. It grows rapidly on potato as a reddish growth made up of minute globular bodies. On the very dry portion of the potato, the growth assumes a canary yellow color. In beef-bouillon, after three days, it grows as a faint white cloud ; there is no marked sediment. The upper layers of the bouillon are colored green. A drop of the bouillon culture under an one-twelfth oil immersion objective shows small bacilli in active motion, usually single, and staining faintly with methyl blue.

No. V. When the gelatine plates are four days old, we see round colonies, evidently liquefying the gelatine with a white opaque dot in the centre surrounded by a transparent zone. The youngest colonies appear only as white dots. Under an one-half inch objective the central area appears dark green and opaque while the peripheral zone is almost transparent and looks like white fur. Two days later the colony has grown to be over one-quarter of an inch in diameter, and has green liquid contents composed of a transparent fluid with much flocculent white matter floating in it.

Grown in tube cultures, at the end of three days, it has liquefied the gelatine in the shape of a funnel from the surface of the gelatine to the end of the line of inoculation. The liquefied gelatine is uniformly cloudy and opaque, with a few white flocculent masses in the lower part of the line of inoculation. Four days later we find the gelatine liquefied for over an inch from the surface. The liquefied gelatine is cloudy and its upper layers are colored green. This bacterium grows rapidly on agar forming an opaque pearly white pellicle with transverse striations and an almost regular border. If held up to the light the border appears almost transparent and has a leafy outline. The agar is colored green. It grows rapidly on potato as a flesh colored mass, almost confined to the line of inoculation.

When grown in bouillon, it renders it cloudy and turns the upper layers green. Later a thick white pellicle forms on the surface. This bacterium produces a marked odor of decomposition, especially in gelatine cultures. A drop of the bouillon culture under an one-twelfth oil immersion objective shows small bacilli in motion.

No. XI. The colonies of this bacterium appear when the gelatine plates are two days old, as round white dots liquefying

the gelatine. A day later we find the colonies to have increased rapidly in size so that they are from one-eighth to one-quarter of an inch in diameter. They have a round regular outline. There is usually a white dot in the centre of the colony, bounded up a transparent zone and outside of this an opaque white zone. When the colonies are four days old most of them have a white round opaque central area about one-eighth of an inch in diameter, surrounded by a liquefied transparent zone. As the colonies get older we have several zones of white opaque matter alternating with liquid transparent zones. The white zones appear as concentric rings and are made up of a tough white skin. The plate cultures of this bacterium are very characteristic. Seen under an one-half inch objective, the colonies are very dark green and opaque even when very young, and usually have a white furry border. Later the dark area becomes differentiated into alternate light and dark zones.

Grown in gelatine tube cultures after three days, we see only a faint white growth along the line of inoculation. No pellicle has formed on the surface. A day later we find that the culture has been growing rapidly, and has formed a transparent egg-shaped bubble which penetrates below the surface of the gelatine. Below the bubble there is a white flocculent area. The growth tends to extend deeply rather than superficially. At the expiration of six days from the date of inoculation, the bubble appears rounder and has grown laterally but not in depth. The white flocculent area has increased considerably and extends even to the end of the needle track. A tough white pellicle covers the lower surface of the bubble.

When the tube culture is twelve days old, the bubble has grown laterally to the sides of the tube. The thick white pellicle covering its lower surface has increased in size with it. The gelatine below the pellicle is liquefied in a funnel-shape and the liquefied gelatine contains a few white flucculi. The tough wrinkled white pellicle which floats on the liquefied gelatine is quite characteristic of this bacterium.

The growth of this bacterium on agar is quite characteristic. It forms a thick white wrinkled skin on the surface of the agar, with a scalloped border. The agar is not colored.

On potato the growth first appears as a finely granular dry crust, but later appears as a thick white wrinkled skin, much like the growth on agar. This bacterium grows well in milk

without producing any gross change. It grows well in bouillon producing no odor nor color. A cloud forms in the bouillon, which rapidly settles and leaves the bouillon clear. After some days a thick white pellicle forms on the surface of the bouillon. A drop of the bouillon culture under an one-twelfth oil immersion objective shows large thick bacilli, sometimes single but more often joined end to end in strings of two or more. They have a slow motion and stain well with methyl blue.

No. XII. Cultures of this bacterium appear on gelatine plates at the end of two days as solid superficial bluish-white colonies about the size of a pin-head. Some colonies appear transparent, others opaque; some convex, others flat. Although bluish, the colonies have not much iridescence. Their outline is fairly round but the border is inclined to be scalloped. A day later the colonies begin to appear concave, liquefying the gelatine slowly. At the end of four days nearly all the colonies show a saucer-shaped depression in the gelatine. Some colonies still remain almost transparent, homogeneous and solid, but most of the colonies are round with a flocculent dirty-white, central area surrounded by a clear liquid zone. Under a three-quarter inch objective the colonies present a very irregular outline with a cloudy white border and a faint yellow center. When they are somewhat younger, they present a more regular outline and have a uniformly pale finely granular appearance. As the colonies grow older the outlines again become more regular. They then have a nearly uniform brown flocculent appearance except at the periphery where there is a narrow white transparent zone.

Gelatine tube cultures at the end of three days show a flat white opaque pellicle with an irregular outline and a slightly depressed center. The gelatine is not colored.

When the tube cultures are seven days old, the white pellicle has made a marked cup-shaped excavation in the gelatine. The pellicle has an almost translucent appearance with the exception of a white ragged opaque line running around the pellicle parallel with the border. There is very slight growth along the line of inoculation. Four days later there is a marked funnel-shaped excavation in the gelatine, covered with a white dry opaque pellicle. The liquefaction of gelatine by this bacterium is not pronounced unless the temperature of the room is kept at 70° F. At lower temperatures it simply forms excavations in the gelatine.

It grows rapidly on agar as a pearly-white opaque growth with a crenated border which has a green iridescence. The agar itself is not colored.

On potato it produces a brownish slimy growth composed of round confluent masses about the size of a pin-head, not confined to the line of inoculation.

Grown in bouillon, after the third day it turns it uniformly cloudy and a considerable amount of a white precipitate settles to the bottom of the tube.

A drop of the bouillon culture under an one-twelfth objective shows sharply defined bacilli with rounded ends, of fairly large size, in motion. They are stained deep-blue with methyl blue. They are frequently found in pairs lying side by side, and also end to end.

No. XIII. After two days' growth on gelatine plates the colonies of this bacterium present three different appearances; first, a bluish-white, homogeneous, opaque solid, with a convex surface and irregular outline, about the size of a pin's head; second, a superficial transparent solid colony with an irregular outline and a white dot in the center from which radiate wavy white lines; third, colonies with an irregular outline, and a dirty-white liquefied central area which is surrounded by a transparent zone with radiating white lines.

All of these colonies if held up to the light show a green iridescence. All of these three colonies described are simply different stages of growth. A day later many other colonies have appeared which resemble those above described but vary much in size. Some of them, however, differ considerably from colonies above described. Thus some colonies have a clear well-defined round outline with uniformly white opaque liquid contents; while others have white opaque and apparently solid contents.

When the colonies are six days old the following appearances may be noted: first, a waxy, opaque, white solid colony with a flat surface except at the center where there is an elevated point; second, much like the first only larger; the elevated point at the center is whiter than the rest of the colony; third, a round well-defined liquid colony, the contents consisting of white flocculent matter. Many of these colonies contain a white opaque homogeneous liquid, in place of the flocculent matter. These colonies are about an eighth of an inch in diameter: fourth, large solid

white colonies with an irregular outline, about one-half inch in diameter. In the center is a white dot, bounding which is an almost transparent zone with a saucer-shaped depression, showing a tendency to liquefaction. The peripheral portion of this zone appears more solid, whiter and more opaque than the more central portion. A day later this colony presents a different appearance. The central portion has become quite liquid and the outline of this portion is very well defined and is bounded by a zone of white opaque solid matter.

All the colonies developed from this bacterium are remarkable for their porcelain white appearance. Under an half inch objective the colonies show an irregular outline, a dark-brown flocculent or woolly central area surrounded by a lighter zone which is covered with interlacing furrows in arrangement somewhat resembling a straw-matting. In many of the colonies the straw-matting appearance does not exist but only a faint white zone, in others the central area has a dark smoky homogeneous appearance. In very old colonies the peripheral zone appears as if made up of brown cells, and somewhat resembles liver tissue, in other places the peripheral zone has a dark furry border.

Grown in gelatine tube cultures, after three days we see a saucer-shaped excavation in the gelatine covered with a thick white waxy pellicle like porcelain. There is a fairly good growth along the line of inoculation. When the cultures are seven days old we find that the growth has extended rapidly, superficially but not deeply. A thick white irregular pellicle covers the surface of the gelatine.

When the cultures are two weeks old the gelatine is liquefied for scarcely half an inch from the surface. The liquefied gelatine is white, syrupy, and almost opaque. A heavy white precipitate has settled on the solid gelatine.

Under an one-twelfth objective a drop of the culture of this bacterium shows medium sized bacilli in active motion, often joined together in long strings. The bacilli stain well with methyl blue.

No. XIV. Colonies of this bacterium appear after four days on gelatine plates, as almost transparent, solid, flat colonies with a finely crenated border and an elevated point in the centre. Two days later the colony is nearly one-quarter of an inch in diameter, with a cloudy bluish white appearance and radiating furrows at the periphery. When the colonies are ten days old they begin to show a saucer-shaped depression in the gelatine.

Under an one-half inch objective, the colonies present a well defined but irregular outline. The colony has a waxy white appearance with crooked furrows running in different directions but with a tendency to a radiating arrangement. In some colonies there is a central area with a worm-eaten appearance. In gelatine tube cultures, after two days we see a bluish-white almost transparent pellicle with an irregular outline. There is slight growth along the line of inoculation. The gelatine is not liquefied nor colored. When the cultures are seven days old there is a cup-shaped excavation in the gelatine covered with a white opaque pellicle with an irregular outline. When the cultures are eleven days old, the appearance is much the same as above described, except the surface of the gelatine which is not covered with the pellicle is turning white and faintly granular. There is a slight growth along the line of inoculation.

It grows slowly on agar producing a white smooth pearly pellicle. After some weeks the growth is quite characteristic. It has a scalloped outline with lines running around it parallel to the border. The agar is not colored.

It appears on potato as a pinkish white growth, composed of fairly dry globules about the size of the head of a pin. The growth on potato is very slow. It grows well in bouillon forming a thick white pellicle on the surface of the bouillon. A drop of the bouillon culture under an one-twelfth objective shows large thick sharply defined bacteria, sometimes single and sometimes in long strings. Occasionally a little motion is observed but most of the bacilli are at rest. They stain well with methyl blue.

No. XXI. Colonies of this bacterium appear on gelatine plates after four days as purple dots about the size of a pinpoint, depressed below the surface of the gelatine, evidently liquefying it. This bacterium grows more slowly than many other forms of water bacteria, but their growth is apparently less affected by cold than the growth of other bacteria, consequently the best way to detect them is to keep the gelatine plates in a cold room (55°–60° F.) By this means this bacterium will appear on the gelatine before it has been liquefied by other forms. When the plates are seven days old we see round well-defined purple colonies, evidently liquefying the gelatine. The colonies are not much larger than the head of a pin.

In gelatine tube cultures at the end of three days, we see only a very slight white growth along the line of inoculation. There is no pellicle apparent on the surface and no liquefaction of the gelatine. When the cultures are seven days old, there is a funnel-shaped excavation in the gelatine, covered with a beautiful purple pellicle. There is only a slight white growth along the line of inoculation. The purple color apparently only is developed where there is free access to air. On agar this bacterium grows rapidly and produces a dense purple pellicle with a narrow white filmy zone at the border. The agar is not colored. It grows fairly well on potato forming a purple pellicle.

In beef-bouillon it grows well forming a white cloud; later a feathery purple pellicle appears on the surface. A drop of the bouillon culture under an one-twelfth objective shows small bacilli, often in pairs, joined end to end; some in active motion but most are motionless.

No. XXII. On gelatine plates, colonies of this bacterium appear after three days. They are then nearly one-quarter of an inch in diameter, and have a white opaque center gradually shading off into a bluish transparent peripheral zone which has a furrowed appearance. In the younger colonies there is a white glistening spot in the center. The colonies are nearly round, but the borders are inclined to be crenated. There are no signs of liquefaction. When the plates are six days old, the peripheral zones of the older colonies have assumed a beautiful purple color. In some colonies there are alternate light and dark-purple zones. The borders are slightly crenated. Most of the colonies have a saucer-shaped depression in the center. In some lights the colonies have a red color. Under an one-half inch objective, the colonies present an irregular outline, a white waxy peripheral zone and a central area somewhat resembling in appearance yellow elastic connective tissue, and in some places having a woven appearance like straw-matting.

In gelatine tube cultures after two days, we see a white, almost transparent pellicle with an irregular outline. The gelatine is neither colored nor liquefied. There is a very slight growth along the line of inoculation. When the tube cultures are seven days old, we see a beautiful purple pellicle with a light colored central area but darker around the borders. There is a saucer-shaped depression in the gelatine. There is a very slight

white growth along the line of inoculation. When the tube cultures are eleven days old, there is a cup-shaped excavation in the gelatine, covered with the purple pellicle above described. Its growth on agar is fairly rapid and at first presents a white waxy pellicle which after a few weeks develops a purple tinge along the borders. The water in the tube has a purple precipitate.

It grows rapidly on potato forming a purple pellicle in forty-eight hours. The purple pellicle has a reddish tinge.

It grows rapidly in bouillon, making the bouillon uniformly cloudy and covering the surface with a pale-purple pellicle. A drop of the bouillon culture under an one-twelfth objective shows medium sized baccilli, usually single and not found in strings, possessing some mobility. They stain well with methyl blue.

No. XXVI. After three days colonies of this bacterium appear on gelatine plates as small white globules. Some colonies which are apparently older have a narrow white opaque border with an irregular outline, and a transparent central area; other colonies have a woolly appearance. Under an one-quarter inch objective, some colonies have a dark granular central area with a lighter ragged border, composed of a mass of fine spicules and granules; other colonies are nearly round with a well-defined outline and are uniformly granular; still other colonies have a small yellow opaque central area surrounded by a wide border of light granular or feathery matter with an irregular outline. Some of the older colonies have irregular outlines and uniformly light granular contents. The colonies which have the woolly appearance macroscopically, microscopically have irregular outlines with peripheral zones composed of highly refracting white polygonal cells, while the central areas are furrowed and have a worm-eaten appearance. When the plates are four days old there are still some small superficial convex apparently solid colonies about the size of a pin head, but most of the colonies are a dirty brown with a saucer-shaped depression in the gelatine. All the older colonies have a granular, semi-transparent border. Under an one-half inch objective, the colonies show a well-defined outline with a furry border and a central brown granular area from which fine dark lines radiate. In some colonies there is an outer zone of highly refracting polygonal cells. In some of the older colonies, the appearance of the central area resembles that of liver cells.

When the plates are seven days old, the colonies have liquefied the gelatine in the shape of a saucer. The contents of the colonies consist of brownish yellow granules. Some of the colonies have an ill-defined outline, others are bounded by an almost transparent ring. Grown in gelatine tube cultures, after three days a saucer-shaped excavation appears in the gelatine, which is covered with a white pellicle which has a yellow central area. The growth along the line of inoculation has a peculiar cork-screw appearance which is quite characteristic. The gelatine is not colored. When the tube cultures are seven days old, the gelatine is liquefied for more than half an inch from the surface. The liquefied gelatine is faintly cloudy and a brown disk of solid matter floats on its surface. A fine brown precipitate has settled down upon the solid gelatine. When the tube cultures are eleven days old, the gelatine is liquefied for about one inch from the surface. The liquefied gelatine is markedly cloudy and opaque.

This bacterium grows rapidly on agar, spreading all over the surface. The growth is very characteristic and has the appearance of being thrown over the agar in splashes. The growth is brown and granular. When the growth is seen in certain lights, it has a pink color. It grows slowly on potato, giving it a thin, smooth, canary yellow coating. Later the growth turns a deep yellow with a purple border which is especially prominent on the moister parts of the potato. In bouillon it grows slowly forming a faint cloud and developing neither odor nor color. Under an one-twelfth objective, a drop of the bouillon culture shows long thin bacilli in motion, very faint and seen with difficulty, usually single and not found in strings, staining fairly well with methyl blue.

No. XXVII. On gelatine plates, after two days colonies of this bacteria appear round, yellow, superficial and solid about the size of a pin-head. A day later the surface of the colonies is markedly convex, and when held over white paper the colonies have a distinctly yellowish-brown color. Under an one-half inch objective the colonies have a regular well-defined border and a coarsely fibrous or flocculent brownish central area surrounded by a yellow finely granular zone. The borders of the younger colonies are slightly ragged and the yellow zone is filled with brown flocculent matter. After ten days or two weeks the colonies develop an odor like that of yeast. In gelatine tube cul-

tures after three days we see a solid white irregular pellicle about the size of a pin-head on the surface of the gelatine. A day later the pellicle appears as a round, brownish-white, opaque drop. When the culture is six days old the brown color of the pellicle is more marked. There is a very decided white growth along the needle-track. Some days later this bacillus slowly liquefies the gelatine. This bacterium grows rapidly on agar, showing a yellow granular pellicle with a scolloped border. The border of the growth is slimy and has an iridescent green color. The agar is not colored. It rapidly forms a thick slimy yellow growth on potato, not confined to the point of inoculation. It grows well in bouillon producing neither color nor odor. A drop of the bouillon culture under an one-twelfth objective shows short fat bacilli often in pairs, in active motion.

No. XXXI. Colonies of this bacterium appear on gelatine plates. When they are two days old, as superficial, solid, yellowish-white masses with a fairly regular outline and about the size of a pin-head. A day later the colonies still appear as opaque white solids, but have assumed an irregular outline and a greenish color. The colonies sometimes have the shape of an oak leaf and sometimes appear as if made up of a combination of several small round colonies. There is a tendency for the colonies to become conical, the central areas of some colonies being raised and pointed. Under an half inch objective the colonies have a clear well-defined outline, fairly regular (not dentated nor scolloped). The colonies appear divided into two ill-defined areas ; the first is the central area which has a dark finely granular appearance ; the second is the peripheral zone which is quite broad, of brownish color and having a feathery or finely granular appearance. By focussing we discover alternate light and dark radiating areas in the peripheral zone.

In gelatine tube cultures, after three days we notice a white solid pellicle on the surface of the gelatine, with an irregular outline. There is marked growth along the track of the needle. A day later the gelatine in the neighborhood of the pellicle begins to be colored green. When the cultures are six days old the pellicle has a conical shape and the gelatine is colored markedly green. This bacterium grows rapidly on agar forming a slimy greenish pellicle not confined to the line of inoculation. The agar is colored green. It grows rapidly on potato forming a slimy brownish-yellow mass composed of large round confluent

globules. It grows well in beef bouillon producing an odor of putrefaction and coloring the more superficial layers of the bouillon green. A drop of the bouillon culture under an one-twelfth objective shows medium sized bacilli in active motion, mostly single but occasionally in pairs joined end to end. The gelatine plate cultures of this bacterium often have another appearance which seems to be developed especially when the plates are made from old tube cultures. That these colonies arise from the same bacterium and are not a contamination may be proved by making repeated pure plate cultures and having two different forms develop. The first form is that described above; the second form is a pale-bluish, flat, almost transparent colony with a white elevated dot in the center. The outline is very similar to the first form macroscopically, but microscopically it presents a much more irregular appearance. Tube cultures inoculated from these colonies present the same appearance as those inoculated from the first form.

No. XXXII. Colonies of this bacterium appear on gelatine plates at the end of two days. They are bluish white pearly solid colonies with a convex surface and slightly irregular outline, though in most cases nearly round. They grow slowly and are not often seen larger than one-eighth of an inch in diameter. After a few days a marked odor of ammonia is developed by their action on gelatine. Under an one-half inch objective, the colonies show a clear sharp outline, and contain a granular dark gray central area surrounded by a peripheral zone which has a fluted appearance made by alternate light and dark areas. As the colonies got older, the central area assumes a dirty brown worm-eaten appearance, and is more sharply defined.

In gelatine tube cultures after three days we see a solid white raised pellicle with an irregular border. A white growth is well marked along the line of inoculation. When the culture is six days old, the pellicle has grown considerably, and has a round border. It is solid, white, and opaque. The gelatine is not colored.

It grows well on agar producing a white pellicle with a fairly regular border. It does not extend broadly over the agar, but confines itself to that portion along the line of inoculation. The agar is not colored. It forms on potato a granular yellowish white growth. Later this develops a wrinkled-skin appearance. It rapidly absorbs water and becomes slimy if the potato is wet.

It grows well in bouillon producing neither color nor odor. A drop of the bouillon culture under an one-twelfth objective shows medium sized bacilli in slow motion, usually single, which do not stain well with methyl blue.

No. XXXIII. When gelatine plates are two days old colonies of this bacterium appear as superficial white almost transparent drops, sometimes round, sometimes irregular in outline. Under an one-half inch objective some of the colonies appear as round, well-defined, finely granular disks ; others darker with a less regular outline and more coarsely granular.

When the plates are four days old, the colonies have a very irregular deeply dentated outline.

In gelatine tube cultures at the end of three days we see a faint white solid homogeneous pellicle with an irregular outline. There is considerable growth along the line of inoculation. The gelatine is neither colored nor liquefied. When the culture is seven days old, it has a flat white opaque solid pellicle with an irregular outline and irregular surface markings. It grows well along the line of inoculation. On agar it grows fairly rapidly, but not spreading far from the line of inoculation. After several weeks the growth turns a yellow color and a yellow precipitate settles at the lower surface of the agar. Later still the growth turns a cinnamon color, and the agar itself also turns the same color. On potato it grows rapidly and has a thick white pellicle with an almost smooth surface except at the centre where there is a tendency to transverse striations. Later the pellicle turns yellow and later still the potato looks as if daubed with molasses.

It grows well in bouillon. A drop of the bouillon culture under an one-twelfth objective shows very small bacilli in active motion, nearly always in pairs, though sometimes single, staining fairly well with methyl blue.

THE CONNECTICUT RIVER.

By Herbert E. Smith, M.D.

The Connecticut River rises in the extreme northern part of New Hampshire and flows southerly, between the States of Vermont and New Hampshire, across Massachusetts and Connecticut, to empty into Long Island Sound. The entire length of the river is about 400 miles, of which the last 70 miles are in the State of Connecticut. Above Massachusetts there is a steep and narrow water shed, from which the river receives numerous small tributaries. Through Massachusetts the basin has an average width of 40 miles, and is mostly of an alluvial formation, although in some portions the river bed is rocky and permanent. From Northampton to Hartford the river passes through meadows, which are overflowed at times of freshets. For nine miles below Hartford, to Rocky Hill, the meadows continue, the banks being mostly a clayey loam on the outsides of the curves, where they are being rapidly washed away, while on the opposite side there are low sandy beaches.

From Rocky Hill to the narrows at Middletown the banks are of a permanent character, and through the narrows, a distance of about a mile, they are high and rocky, and the water deep. Below this point to the sound, the banks are hilly, being in some places rocky, and are not being much washed away. In Massachusetts there are four considerable tributaries; the Chicopee and Miller's river from the east, and the Deerfield and Westfield rivers from the west. The chief tributary in Connecticut is the Farmington River, which empties at Windsor, 5½ miles above Hartford, and comes from the west of Talcott mountains. At Hartford there is the Little, or Park River, also coming from the west. From the east there are the Scantic River, 7½ miles above Hartford, and the Hockanum, 1½ miles below Hartford. The other streams are all small and contribute but little water except during freshets.

Flowage of these Tributaries, in cubic feet, per second.*

	Maximum.	Mean.	Least.
Chicopee River	9,635	1,374	669
Westfield River	28,633	1,287	500
Farmington River	24,375	944	450
Scantic River	6,116	139	35
Park River	2,308	139	25
Hockanum River	6,167	132	60

* Report of the Chief of Engineers, U. S. A., 1878, Part I, Appendix B.

Flowage of the Connecticut River.

In the years 1874–77 an elaborate study of the discharge of the Connecticut River was made by Gen. Theo. G. Ellis, the results of which are given in the Report already quoted. During this period a gauge was established at the steamboat wharf, at the foot of State street, in Hartford. Gen. Ellis gives the following table, by which the discharge of the river may be estimated.

Discharge of the Connecticut River at Hartford, for each foot in Height, by the United States Gauge at the foot of State Street.

Height, Feet.	Discharge per second, Cubic Feet.	Height, Feet.	Discharge per second, Cubic Feet.	Height, Feet.	Discharge per second, Cubic Feet.
0	5,000	10	37,500	20	103,700
1	5,500	11	42,900	21	112,700
2	6,600	12	48,500	22	122,100
3	8,500	13	54,200	23	132,000
4	11,100	14	60,100	24	142,400
5	14,500	15	66,200	25	153,400
6	18,400	16	72,700	26	164,800
7	22,700	17	79,600	27	176,200
8	27,400	18	87,100	28	187,600
9	32,400	19	95,200	29	199,200

A record of the readings of the State street gauge is kept by the officers of the Hartford & New York Transportation Co., who have courteously furnished the data for the following table, giving the heights of the water in the period during which analyses of the river water were made. Most of the figures refer to a single observation, made about 7 A. M., but some are the averages of a morning and an afternoon reading.

Readings on the United States Gauge at Hartford.

In feet and hundredths.

1890.		1890.		1890.	
June 23	3.90	July 9	3.50	July 24	2.60
24	3.80	10	3.50	25	2.60
25	3.50	11	3.75	26	2.60
27	3.20	12	2.70	28	3.70
28	3.60	14	2.60	29	3.50
30	4.10	15	2.70	30	3.20
July 1	4.10	16	2.80	31	3.20
2	4.00	17	2.80	Aug. 1	3.30
3	4.50	18	2.65	2	3.20
4	4.00	19	2.70	4	2.80
5	3.80	21	2.10	5	3.00
7	3.80	22	2.60	6	3.10
8	3.80	23	2.60	7	2.40

	1890.	
Aug.	8	2.10
	9	2.10
	11	1.20
	12	2.10
	13	2.40
	14	2.30
	15	2.30
	16	2.10
	18	1.70
	19	2.30
	20	2.80
	21	3.20
	22	3.20
	23	2.90
	24	3.50
	25	4.50
	26	5 50
	27	5.80
	28	6.30
	29	6.50
	30	7.80
Sept.	1	7.40
	2	7.30
	3	6.90
	4	6.40
	5	5.40
	9	5.00
	10	4.30
	11	4.50
	12	6.50
	13	6.40
	15	8.80
	16	9.40
	17	10.90
	18	14.30
	19	15.60
	20	14.00
	22	14.00
	23	8.10
	24	6.80
	25	5.10
	26	5.30
	27	5.20
	29	4.90
	30	5.00
Oct.	1	4.70
	2	4.60
	3	4.30
	4	4.10
	6	3.70
	7	4.00
	8	4.00
	9	4.60
	10	5.00
	11	5.10
	13	4.80
	14	5.10
	15	5.00
	16	4.90
	17	5.50

	1890.	
Oct.	18	8.10
	20	15.00
	21	16.20
	22	15.80
	23	13.10
	24	9.95
	25	14.50
	27	14.90
	28	12.35
	29	10.20
	30	9.10
	31	8 40
Nov.	1	8.40
	3	7.20
	4	7.30
	5	6.80
	6	6.60
	7	6.20
	8	6.00
	10	5.70
	11	5.70
	12	6.10
	13	6.30
	14	6.30
	15	6.00
	17	5.40
	18	5.80
	19	8.95
	20	10.40
	21	10.10
	22	9.40
	24	7.25
	25	6.80
	26	6.25
	27	5.85
	28	5.50
	29	5.10
Dec.	1	4.50
	2	4.50
	3	4.50
	4	4.70
	5	4.40
	6	4.50
	8	5.30
	10	5.80
	11	5.60
	12	5.50
	15	5.00
	18	6.00
	1891.	
Jan.	12	9.25
	13	10.80
	22	8.80
	23	15.50
	24	17.25
	25	17.40
	26	16.60
	30	11.45
Feb.	1	11.30
	3	12.20

	1891.	
Feb.	4	11.95
	5	10.00
	7	9.90
	10	8.35
	17	8.40
	18	11.14
	19	12.75
	20	12.40
	21	10.80
	22	9.25
	23	8.95
	24	8.30
	25	8.60
	26	13.55
	28	16.90
Mar.	2	14.00
	3	11.80
	4	10.60
	5	9.00
	7	8.20
	9	7.60
	10	11.40
	11	13.40
	12	13.20
	13	12.60
	14	14.15
	16	15.20
	17	14.10
	18	12.20
	19	10.90
	20	10.20
	21	9.50
	23	11.15
	24	15.00
	25	17.35
	26	19.05
	27	18.80
	28	17.55
	29	15.85
	30	14.90
	31	14.70
April	1	14.35
	2	13.50
	3	13.10
	4	14.00
	5	13.50
	6	12.95
	7	11.30
	8	10.30
	9	9.90
	11	10.20
	12	11.80
	13	15.30
	14	17.60
	15	18.00
	16	19.00
	17	19.40
	18	19.20
	19	19.00
	20	19.15

1891.	
April 21	18.90
22	18.10
23	17.15
24	16.70
25	16.20
27	14.20
28	13.20
30	10.60
May 1	9.40
2	8.90
4	8.10
5	8.00
6	7.80
7	7.80
8	7.50
9	7.20
11	6.30
12	6.00
13	5.90
14	6.00
15	6.00
16	6.00
18	6.20
19	7.90
20	8.30
21	8.00
22	7.50
23	6.40
25	5.80
26	5.70
27	5.40
28	5.00
29	4.70
30	4.70
June 1	4.70
2	4.70
3	4.80
4	5.10
5	6.10
6	5.80
8	4.90
9	4.80
10	4.50
11	4.10
12	3.70
13	3.20
15	2.60
16	2.70
17	2.70
18	2.70
19	3.00
20	3.40
22	4.30

1891.	
June 23	4.30
24	4.90
25	4.70
26	4.40
27	4.00
28	3.00
30	2.80
July 1	2.60
2	2.70
3	2.60
4	2.80
6	2.80
7	2.80
8	3.30
9	3.40
10	3.40
11	3.40
13	2.80
14	2.50
15	2.30
16	2.40
17	2.20
18	2.30
20	2.50
21	3.30
22	3.30
23	3.10
24	3.40
27	3.30
28	2.80
29	2.90
30	3.30
31	3.40
Aug. 1	4.40
3	3.60
4	3.30
5	3.10
6	3.10
7	3.20
10	2.90
11	2.70
12	2.60
13	2.20
14	1.50
17	1.50
18	2.60
19	3.00
20	3.20
21	3.20
22	2.60
24	2.10
25	2.20
26	1.50

1891.	
Aug. 27	1.60
28	2.40
29	4.30
30	3.70
Sept. 1	3.40
2	2.90
3	2.00
4	2.10
5	3.00
8	3.10
9	3.00
10	3.10
11	2.80
12	2.40
14	1.90
15	2.20
16	2.60
17	2.50
18	2.60
21	2.10
22	2.70
23	2.70
24	2.50
25	2.20
26	1.80
28	1.00
29	1.58
30	1.67
Oct. 1	1.67
2	2.00
3	1.08
5	2.00
6	2.00
7	2.00
8	3.00
9	2.25
10	2.33
12	1.17
13	2.25
14	2.50
15	2.00
16	2.33
17	1.83
19	2.00
20	3.00
21	2.67
22	2.50
23	2.67
26	1.50
27	2.33
28	1.50
Nov. 2	0.21
3	1.67

The lowest flow which has been recorded, is that of Nov. 2, 1891, when it was 5,104 cubic feet per second. During the period in which the analyses were made, Aug., 1890, to June, 1891, inclusive, the greatest flow recorded, was on April 17, 1891, namely,

98,600 cubic feet per second, and the lowest was 5,700 cubic feet, on Aug. 11, 1890.

The samples for analysis were taken about the 25th of each month, and the average discharge of the river for the period just before these dates is shown in the following table. The "average height," as given in this table, is the average of the heights for the ten days preceding the dates the samples were collected, as far as the table of readings furnished such data.

DISCHARGE OF THE CONNECTICUT RIVER AT HARTFORD.

Average for the ten days preceding the dates when samples were taken.

Month.	Average Height, Feet.	Average Discharge per second, Cubic Feet.	Month.	Average Height, Feet.	Average Discharge per second, Cubic Feet.
1890. June	3.67	10,320	1891. January	14.74	64,370
July	2.61	7,740	February	10.29	39,120
August	2.85	8,310	March	12.98	54,200
September	10.70	41,280	April	18.29	89,530
October	10.80	41,820	May	7.76	26,460
November	7.90	26,930	June	3.53	9,800
December	5.50	16,450	July	2.75	8,025
			August	2.55	7,550
			September	2.46	7,550
			October	2.37	7,360

Effect of Tides.—The Connecticut River is affected by the tides in Long Island Sound, but the fluctuations are irregular at Hartford, being modified and sometimes entirely neutralized by the action of the wind. Very high tides, occurring with a strong southerly wind, are noticeable during low water even to the foot of the Enfield Rapids. During low water the range at Hartford averages about 10 inches, but tides produce no effect with more than five feet of water at the guage.

Analyses of the water of the Connecticut were made in Massachusetts from 1887 to 1889, at Turner's Falls and just below Springfield, but no systematic examinations had been made in this State, consequently samples were collected during the year 1890–91, at Warehouse Point, Rocky Hill, and Goodspeed's. These samples were taken on the same day at each of these places, and each time at the same point, well out in the current and one foot below the surface.

Warehouse Point.—The samples from this place were collected just below the Enfield Rapids, at a point about 13 or 14 miles below Springfield, and far enough up the river to avoid the sewage of Windsor Locks. These samples may be taken as showing the composition of the water as it enters the State, as they were

taken at a point where the sewage, discharged into the river at Northampton, Holyoke, Chicopee, and Springfield, must have been well mixed in passing over the Rapids. Samples were taken by Mr. Simeon O. Abbey.

Rocky Hill.—This point is about 20 miles below Warehouse Point and 9 miles below Hartford. Between the first and second stations, the river receives its chief tributaries in Connecticut, namely: the Farmington, which is but little polluted; the Park River, which is grossly polluted by the sewage of New Britain and Hartford; and the Hockanum, which discharges the sewage of Rockville and Manchester. The chief pollution of the river is, therefore, within 7 to 9 miles of this collecting station. Samples were collected by Mr. Wm. Beebe.

Goodspeed's.—This station is about 22 miles below Rocky Hill. The chief pollution of the stream between the second and third stations occurs at Middletown, about 15 miles above Goodspeed's. Below this station there is but little pollution, therefore the results of the analyses of these samples should show the greatest pollution of the river, as a whole. Samples were collected by Mr. W. W. Tyler.

The following tables show the results of the analyses of these samples. Some of the results are also shown in a graphical form in the charts.

CHEMICAL EXAMINATION OF CONNECTICUT RIVER WATER.

Samples from Warehouse Point.

Figures indicate milligrams per liter, or parts per million. Water filtered through paper.

Date.	Color.	Suspend. Matter. Fixed.	Suspend. Matter. Volatile.	Residue on Evaporation. Total at 100° C.	Residue on Evaporation. Loss on Ignition.	Residue on Evaporation. Fixed.	Chlorine.	Nitrogen. Of Free Ammonia.	Nitrogen. Of Albuminoid Ammonia.	Nitrogen. Of Nitrites.	Nitrogen. Of Nitrates.	Hardness as $CaCO_3$.	Oxygen consum'd from Permanganate ½ h. at 100° C.
1890													
Aug. 26..	0.4	15.7	2.1	59.0	12.5	46.5	1.55	0.050	0.158	0.003	0.07	26.	4.95
Sept. 25..	.6	3.7	1.4	57.5	14.5	43.0	1.30	.038	.150	.002	.12	24.	7.70
Oct. 24..	.5	17.2	3.8	46.0	12.5	33.5	1.18	.024	.134	.002	.06	21.	7.90
Nov. 25..	.3	3.0	1.0	45.5	12.0	33.5	1.05	.024	.120	.002	.21	23.	6.35
Dec. 26..	.2	1.4	1.0	56.0	5.5	50.5	1.65	.044	.118	.002	.24	33.	4.20
1891													
Jan. 26..	.2	....	...	34.5	8.0	26.5	0.88	.024	.098	.003	.09	...	4.70
Feb. 25..	.2	24.6	5.0	36.0	3.5	32.5	1.30	.018	.104	.001	.07	15.	4.25
Mar. 25..	.2	100.6	8.6	30.0	5.5	24.5	1.25	.024	.096	.002	.08	18.	2.80
April 25..	.2	55.6	4.8	29.5	6.0	23.5	.75	.034	.136	.002	.12	17.	5.60
May 27..	.3	2.6	1.0	44.0	7.0	37.0	1.08	.042	.130	.001	.12	25.	5.05
June 24..	.1	5.2	1.4	48.0	7.5	30.5	1.58	.052	.138	.002	.09	32.	3.60
Average	.3	20.9	2.7	44.2	8.6	35.6	1.23	.034	.126	.0018	.12	23.	5.19

Samples from Rocky Hill.

Figures indicate milligrams per liter, or parts per million. Water filtered through paper.

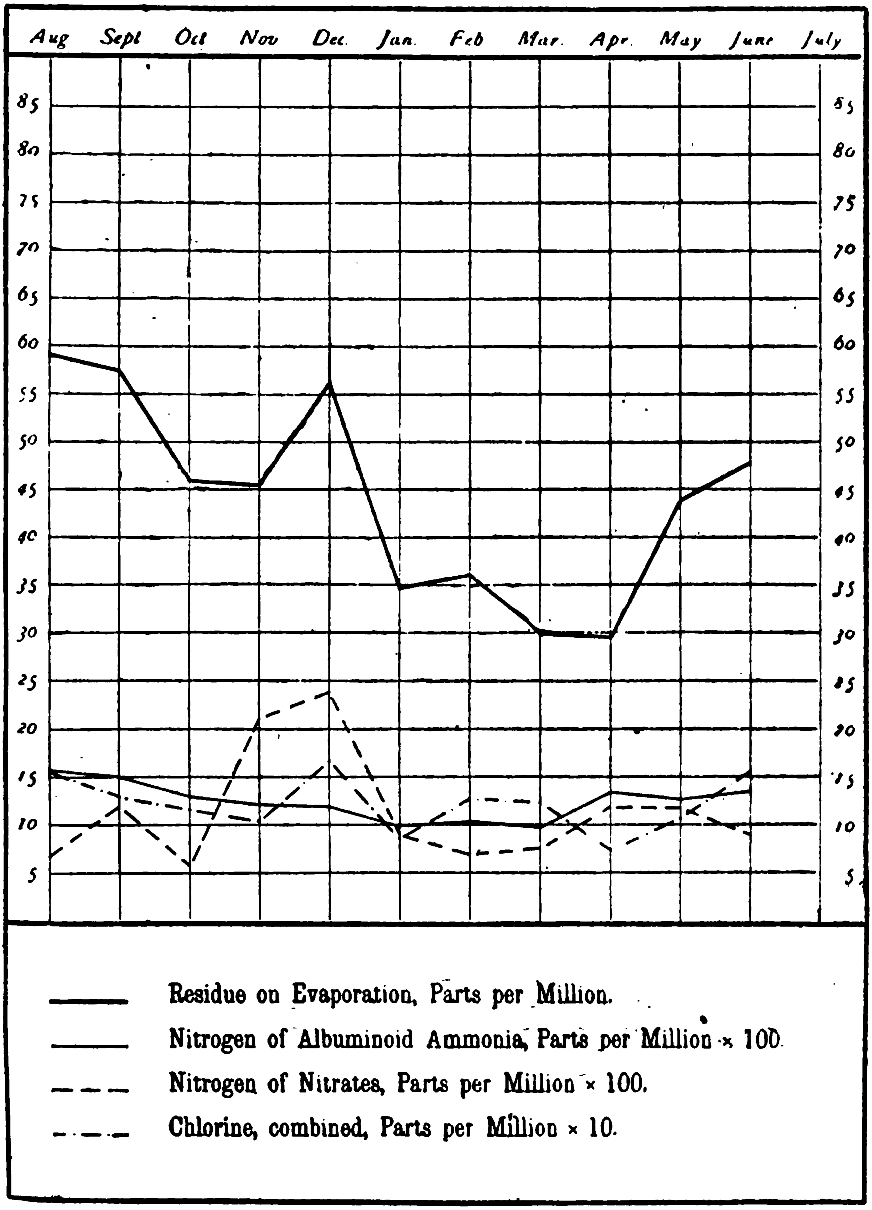
Date.	Color.	Suspend. Matter. Fixed.	Suspend. Matter. Volatile.	Residue on Evaporation. Total at 100° C.	Residue on Evaporation. Loss on Ignition.	Residue on Evaporation. Fixed.	Chlorine.	Nitrogen. Of Free Ammonia.	Nitrogen. Of Albuminoid Ammonia.	Nitrogen. Of Nitrites.	Nitrogen. Of Nitrates.	Hardness as $CaCO_3$.	Oxygen consum'd from Permanganate ½ h. at 100° C.
1890													
Aug. 26..	0.3	22.0	1.7	59.0	14.5	44.5	1.50	0.054	0.160	0.003	0.07	25.	3.55
Sept. 25..	.5	10.0	2.4	57.0	15.0	42.0	1.50	.040	.160	.002	.12	25.	7.50
Oct. 24..	.5	21.6	2.4	49.5	13.0	36.5	1.23	.028	.160	.004	.06	22.	7.65
Nov. 25..	.3	8.0	2.0	44.0	11.5	32.5	1.08	.026	.124	.001	.24	24.	6.30
Dec. 26..	.2	1.4	1.0	58.0	5.5	52 5	1.75	.046	.132	.002	.18	35.	4.30
1891													
Jan. 26..	.2	9.6	1.8	34.5	9.0	25.5	0.85	.028	.116	.002	.08	...	4.55
Feb. 25..	.2	13.6	2.4	36.0	2.0	34.0	1.30	.008	.092	.001	.05	19.	3.75
Mar. 25..	.2	42.4	3.8	30.5	5.0	25.5	1.55	.020	.108	.001	.09	19.	2.80
April 25..	.2	50.0	3.4	32.0	8.5	23.5	.75	.036	.150	.002	.12	18.	5.55
May 27..	.3	6.0	1.8	42.5	6.0	36.5	1.00	.036	.154	.003	.11	25.	5.80
June 24..	.1	10.8	1.2	47.5	6.0	41.5	1.55	.046	.132	.002	.10	37.	3.65
Average	.3	17.8	2.2	44.6	8.7	35.9	1.28	.033	.135	.0019	.11	25.	5.04

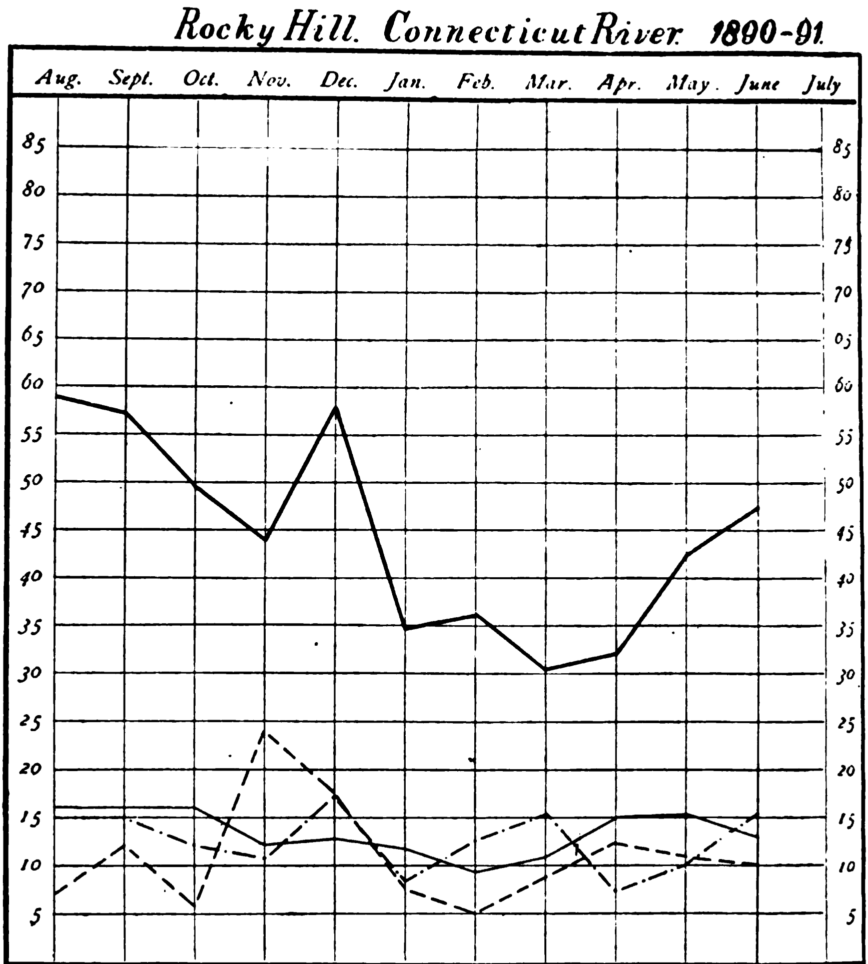
Samples from Goodspeed's.

Figures indicate milligrams per liter, or parts per million. Water filtered through paper.

Date.	Color.	Suspend. Matter. Fixed.	Suspend. Matter. Volatile.	Residue on Evaporation. Total at 100° C.	Residue on Evaporation. Loss on Ignition.	Residue on Evaporation. Fixed.	Chlorine.	Nitrogen. Of Free Ammonia.	Nitrogen. Of Albuminoid Ammonia.	Nitrogen. Of Nitrites.	Nitrogen. Of Nitrates.	Hardness as $CaCO_3$.	Oxygen consum'd from Permanganate ½ h. at 100° C.
1890													
Aug. 26..	0.3	4.8	0.4	62.5	12.0	50.5	2.23	0.056	0.164	0.004	0.10	30.	3.90
Sept. 25..	.5	2.9	.8	57.0	16.0	41.0	1.30	.034	.132	.002	0.11	24.	7.70
Oct. 24..	.5	11.6	2.4	51.0	11.5	39.5	1.25	.030	.156	.002	0.06	22.	7.55
Nov. 25..	.3	3.8	2.4	44.5	10.0	34.5	1.03	.022	.144	.001	.24	26.	5.65
Dec. 26..	.2	2.4	8.0	56.0	7.5	48.5	1.73	.042	.122	.002	.34	34.	4.10
1891													
Jan. 26..	.2	43.2	5.2	34.0	9.0	25.0	0.93	.030	.130	.000	.10	...	4.30
Feb. 25..	.2	8.8	2.2	35.5	4.0	31.5	1.43	.016	.144	.002	.06	20.	3.85
Mar. 25..	.2	43.0	3.2	29.0	4.0	25.0	1.50	.026	.100	.001	.06	18.	2.90
April 25..	.2	13.0	1.8	31.0	8.0	23.0	.83	.044	.166	.001	.12	16.	5.10
May 27..	.4	4 2	2.4	41.5	6.5	35.0	1.05	.044	.124	.001	.12	24.	5.40
June 24..	.1	14.0	2.6	53.0	8.0	45.0	1.63	.054	.134	.002	.11	37.	3.65
Average	.3	13.8	2.9	45.0	8.8	36.2	1.36	.036	.138	.0015	.13	25.	4.92

Warehouse Point Connecticut River 1890-91





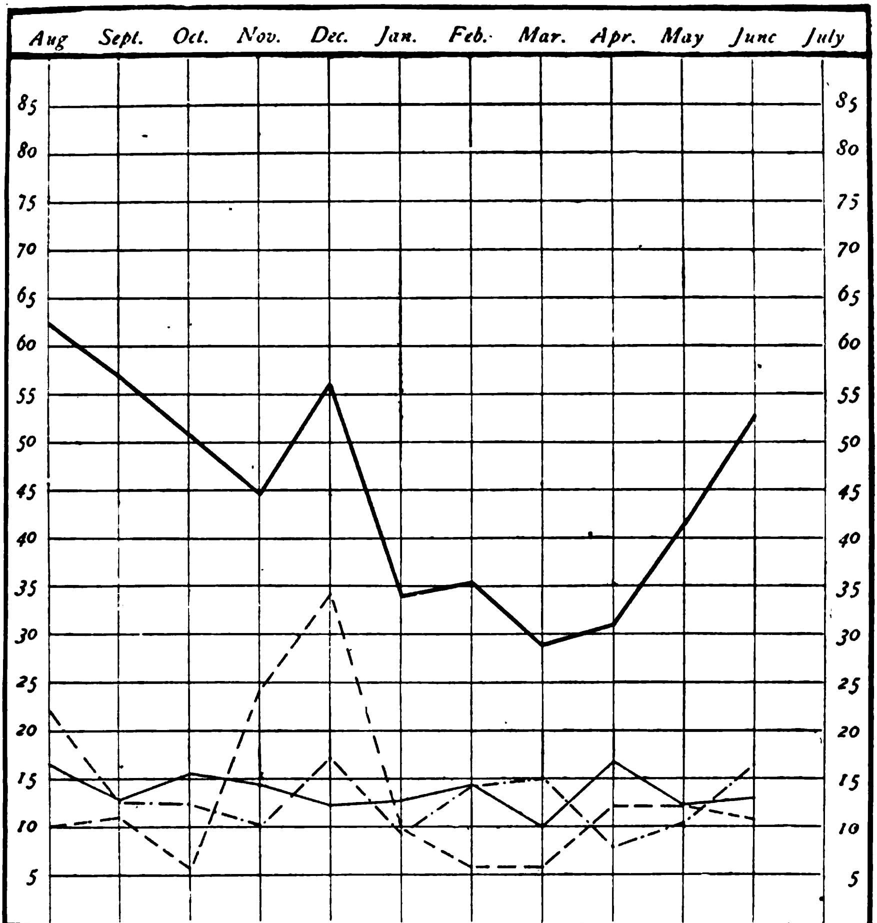
Residue on Evaporation, Parts per Million.

Nitrogen of Albuminoid Ammonia, Parts per Million × 100.

Nitrogen of Nitrates, Parts per Million × 100.

Chlorine, combined, Parts per Million × 10.

Goodspeeds. Connecticut River. 1890-91.



Residue on Evaporation Parts per Million.

Nitrogen of Albuminoid Ammonia, Parts per Million × 100.

Nitrogen of Nitrates, Parts per Million × 100.

Chlorine, combined, Parts per Million × 10.

Special Examination, October 13, 1891.

Figures indicate milligrams per liter, or parts per million.

	Color.	Residue on Evaporation. Total at 100° C.	Loss on Ignition.	Fixed.	Chlorine.	Nitrogen. Of Free Ammonia.	Of Album. Ammonia.	Of Nitrites
Warehouse Point	0.3	71.5	5.5	65.0	2.80	0.046	0.160	0.001
Rocky Hill	.4	69.5	6.0	63.5	3.00	.090	.176	.002
Goodspeed's	.5	69.0	5.5	63.5	3.50	.052	.136	.001

That the Connecticut River receives large amounts of sewage is very certain, for Holyoke, Chicopee, Northampton, Springfield, Hartford, Middletown, and many smaller riparian towns, sewer directly into it. The cities named have an aggregate population of about 170,000. The entire drainage area of the river is 11,269 square miles. In Connecticut there are within this area forty-nine towns having a total population of 119,000.

The small effect of the sewage and drainage thus received, on the composition of the river water, is seen by a comparison of the analyses that have been made of the water at different points.

In the years 1887–89, analyses were made by the Massachusetts Board, of the river water at Turner's Falls, in the town of Montague, and just below Springfield. The Springfield samples gave such irregular results as to indicate that they were taken so close to the city that the sewage was not mixed with the general river water.

The following table shows the averages of the results obtained at Turner's Falls in comparison with those obtained in Connecticut:

Average Results of Monthly Analyses of Connecticut River Water.

Figures indicate milligrams per liter, or parts per million. Water filtered through paper.

	Date.	Color.	Residue on Evaporation. Total at 100° C.	Loss on Ignition.	Fixed.	Chlorine.	Nitrogen. Of Free Ammonia.	Of Albumin'd Ammonia.	Of Nitrites.	Of Nitrates.
Turner's Falls	1887–89	0.3	49.1	10.2	38.9	1.00	0.025	0.104	.0026	0.12
Warehouse Point	1890–91	.3	44.2	8.6	35.6	1.23	.034	.126	.0018	.12
Rocky Hill	" "	.3	44.6	8.7	35.9	1.28	.033	.135	.0019	.11
Goodspeed's	" "	.3	45.0	8.8	36.2	1.36	.036	.138	.0015	.13

That the composition of the water is so little affected by the sewage entering it, as it is shown to be in these results, is due to the large flow. The total amount of sewage entering the river is unknown. Hartford uses but 5,000,000 gallons of water daily, and of course this does not all appear as sewage, but the flow of the river at Hartford, even when there is but two feet of water shown by the gauge, is 2,039,695,000 gallons per day, and on one day, during the period of the investigation, it was over 30,500,000,000 gallons.

When the water is unusually low, however, the sewage may make a very obvious impression on the general composition of the water, as is shown by the samples taken on October 13. At this time the relative contamination was sufficient to raise the chlorine in the river above the normal for the localities where the samples were taken, though usually the chlorine of the river is far below the normals in this State.

The amount of organic matter in the water is not large compared with our surface waters, and only a small part of it can be attributed to sewage. It is difficult to believe that the amount of it that is so derived is sufficient to cause, as *dead organic matter*, any evil results in the persons drinking it. But evil results from dead organic matter, is not what is to be feared from drinking highly diluted sewage. The dangerous elements are the disease germs, and the endemic disease to be particularly feared is typhoid fever. Chemical analysis does not show the danger in this class of waters, and even very numerous bacteriological examinations would be likely to fail to isolate the typhoid bacillus from the host of other bacteria found in the river water.

Experience elsewhere teaches emphatically, that a sewage-polluted river is not a safe water supply, although some still do not believe that this is true for a large river with a relatively small sewage contamination.

The crucial test is to use the water, and in 1891 the city of Hartford did use the Connecticut River water, owing to the failure of the usual supply, from October 3 to December 8, and from December 22 to December 30, at a time, therefore, when the river was at its lowest.

The City Board of Health urged the people to boil all the water used for drinking, and it is believed that this was quite generally done, though of course many neglected to do it, and in some places it could not be done.

Unfortunately, no systematic study has yet been made of the health of the city during and just after this period, so the data for ascertaining the full effect of using the water are not available. The following facts bearing on the subject are taken from the records of boards of health. There was the usual amount of typhoid fever in Springfield during the year; the number of deaths in 1890 being 14, and in 1891, 13. In Hartford there were 32 deaths in 1890 and 42 in 1891, this being the largest number in ten years. In New Haven there were 23 deaths in 1890 and 21 in 1891. The record of typhoid fever by months in Hartford and New Haven, which may be taken for comparison as being the largest city in the State, is as follows:

		Aug.	Sep.	Oct.	Nov.	Dec.	Jan.	
Cases reported to local Boards of Health:								
Hartford	1891	11	12	7	26	30	14	1892
New Haven	"	19	35	7	13	3	6	"
Deaths:								
Hartford	1890	4	7	3	4	2	1	1891
	1891	4	3	5	8	13	7	1892
New Haven	1890	4	3	6	3	1	1	1891
	1891	4	3	4	3	2	3	1892

If these facts cannot be taken as proving absolutely that the use of the Connecticut River water was the cause of typhoid fever in Hartford, they very strongly indicate that such was the case. The point of special significance is the increased number of cases and deaths during the second year in the months of November, December, and January. These are not the months when this fever is usually most prevalent, but they are the months when cases originating in the use of the water would have appeared.

If we may consider that a considerable part of these cases originated in this way, the effect of the use of the river water was what experience elsewhere teaches, and indeed what the writer and others predicted, namely, that there would be a considerable increase in the number of cases of typhoid fever, but that there would not be a large epidemic.

As to the source of the germs in the river at the location of the pumping works, we may look to towns which discharge their sewage into the stream in Massachusetts, or perhaps to Hartford itself, for I am informed by a gentleman having much to do with the river, that at times the tides cause the sewage to back up stream, even as far as the pumping works.

It would seem to be clear, that although the sewage entering the Connecticut River is so largely diluted as to have a scarcely perceptible effect on the chemical composition of the water as a whole, it is unsafe for drinking at any point in this State. As far as is known to the writer no provision is made for its use as a public supply except at Hartford, where it is intended to be used as an emergency supply only. The analyses afford no evidence that the river is sufficiently polluted to make it a sanitary nuisance to the towns through which it flows, except it be used for drinking. That the contamination is sufficient to be a cause for the reported diminution of the fish of the river, appears to the writer to be doubtful.

TREASURER'S REPORT

FOR YEAR ENDING JUNE 30, 1891.

[Verified by vouchers in Comptroller's Office.]

The Treasurer begs leave to report that there was received from Comptroller, on account of appropriation to State Board of Health :

		RECEIPTS.	
1890.			
July	1.	Cash on hand,	$ 15.41
	9.	" from Comptroller for expenses,	800.00
Oct.	30.	" " " "	800.00
1891.			
Jan.	22.	" " " "	800.00
April	10.	" " " "	800.00
June	22.	" " " "	500.00
		" on salary account at sundry times,	1,800.00
		Making total receipts,	$5,515.41

		EXPENDITURES.		
		For traveling and other necessary expenses of members of the Board, when on duty,	$624.82	
		For books and subscriptions to periodicals,	129.28	
		" printing, stationery, etc.,	1,359.64	
		" clerical assistance in Secretary's office,	600.00	
		" postage,	476.50	
		" express charges, telegrams, etc.,	19.15	
		" insurance,	5.25	
		" book shelves and office expenses,	17.85	
		" light and fuel,	63.00	
		" services of experts,	318.50	
		" expenses of experts and scientific apparatus,	59.02	
		" annual dues to Nat. Conf. of S. B. H.,	10.00	
		" salary of Secretary,	1,800.00	
				$5,483.01
July	1.	Covered back into the Treasury,		32.40
				$5,515.41

STATE BOARD OF HEALTH

In account with Appropriation for Pollution of Streams.

The Treasurer begs leave to report that he has received from the Comptroller on account of the Pollution of Streams investigation:

1890.	RECEIVED.		
July 1.	By cash on hand,	$386.92	
Aug. 18.	Cash from Comptroller,	1,000.00	
1891.			
Jan. 8.	" " "	1,000.00	
June.	" " "	500.00	
			$2,886.92

EXPENDED.		
Express charges, Adams Express Co.,	151.00	
Paid for expert services,	2,323.59	
Expenses of experts and scientific apparatus,	277.88	
Books and journals,	32.00	
Gas in laboratory,	96.20	
Printing,	6.25	
		$2,886.92

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Engineering Record.
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Journal D'Hygiene Populaire.
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Burlington, Vt.	Minneapolis, Minn.
Cincinnati, Ohio.	New Haven, Conn.
Cleveland, Ohio.	New York.
Detroit, Mich.	Paris, France.
Dublin, Ireland.	Patterson. N. J.
Hartford, Conn.	Portland, Me.
Keokuk, Iowa.	Rome, Italy.
Knoxville, Tenn.	St. Paul, Minn.
London, England.	St. Louis, Mo.
Manchester, N. H.	Edinburgh, Scotland.

State Board of Health.

BUREAU OF VITAL STATISTICS,

STATE OF CONNECTICUT.

REGISTRATION REPORT

FOR THE

YEAR ENDING DECEMBER 31, 1890.

NEW SERIES—No. 13.

Printed by Order of the Legislature.

NEW HAVEN, CONN.:
TUTTLE, MOREHOUSE & TAYLOR, PRINTERS.
1891.

STATE BOARD OF HEALTH

AND

BUREAU OF VITAL STATISTICS.

HON. A. E. BURR, Hartford, PRESIDENT.

DR. JOHN S. BUTLER, Hartford.*

PROF. W. H. BREWER, New Haven.

DR. G. H. WILSON, Meriden.

HON. ELISHA JOHNSON, Hartford.

DR. RALPH S. GOODWIN, Thomaston.

PROF. C. A. LINDSLEY, M.D., New Haven, SECRETARY, AND SUPERINTENDENT OF REGISTRATION OF VITAL STATISTICS.

* The vacancy caused by the death of Dr. Butler in July was filled by the Governor, by the appointment of

Dr. N. E. WORDIN, of Bridgeport.

Office of the Bureau of Vital Statistics,
State House, Hartford, Nov. 30, 1891.

To his Excellency, the Governor of the State of Connecticut:

Sir:—In accordance with the laws of this State, I have the honor to submit to you the detailed abstracts of the Births, Marriages, Divorces and Deaths, that were registered in Connecticut in the year 1890, together with a few suggestions and inferences on the main features of the Vital Statistics of that year.

Your very obedient servant,

C. A. LINDSLEY, M.D.,

Superintendent of Registration of Vital Statistics.

REGISTRATION REPORT.

1890.

To His Excellency, the Governor of Connecticut:

I have the honor to submit herewith the Thirteenth Annual Report on the Births, Marriages and Deaths registered in Connecticut in the year 1890, under the supervision of the State Board of Health.

The General Features of the Report.

It consists chiefly of tabulated statistics, which are intended to present in a comprehensive and concise form, in addition to the number of births, marriages and deaths, such other cognate facts as will contribute to the study of social science.

There are certain defects, however, inherent in the present system of registration, which greatly limits the utilization of even those facts which are ascertained. These defects have been often mentioned in former reports and need not be further spoken of in this place.

It is very satisfactory, however, to be able to state that the Registration of Vital Statistics in the towns of the State in 1890 was more full and complete than it ever has been before since the organization of the State Board of Health. The abstracts of the records made by the Registrars in their respective towns were more fully and carefully made than ever before. I may be pardoned for reiterating here a statement so often expressed, because it seems desirable to keep it in the public mind, to wit: the dominant defect in our system, which is preëminent above all

others, lies in this matter of abstracts. It is practically impossible to obtain from town clerks, who are *ex-officio* the Registrars, in each town, such full and comprehensive abstracts of their records as will include all the details of fact which the various certificates received by them for record supply. Thus it happens, that while the certificates of many important facts connected with vital statistics are very fully reported to the town Registrars for record, only a limited portion of them are available through these official abstracts for a general report on the Vital Statistics of the State.

In the tables below presented, the forms of previous years have been adhered to, with a few additional tabulations which statistical students will notice. The three great events in the human career are enumerated for each town in the State, with a numerical statement of sex, nativity, parentage, etc.

A classified list of causes of death with the number of fatal results, from each cause, in every town.

Tables are also made showing deaths from specified causes in each month and the ages of the decedents, and sex.

The rates per 1,000 of the population have also been computed and stated in various ways, not only of deaths but also of births and marriages.

Comparative statements are also made in tabular form, showing results in 1890 as compared with the same in previous years.

Some of the more prominent diseases are specially tabulated for convenience of the student.

A table of occupations of decedents is also submitted, with their ages. This table has perhaps but small practical value. In many instances the occupations named are of a very indefinite character and not at all indicative of any special exposures of health. Laborers, factory hands, railroad hands, clerks, merchants, superintendents, etc., without specifying the particular character of employment, whether superintendents of powder mills or Sunday schools.

There are also tables showing the differences, if any, as regards native and foreign populations.

The Population.

The census of 1890, so far as the enumeration of the people is concerned, is now complete, and the statement of the population

of every town in Connecticut by the Superintendent of the Census has been published.

Assuming the counting to be correct, it will afford a reliable basis upon which to compute birth and death rates, far more satisfactory and trustworthy than much of the guess-work of town clerks, upon which we have had to depend for the last half decade.

As compared with the census of 1880 the changes in the population of the counties appear as follows:

INCREASE AND RATE OF INCREASE IN EACH COUNTY.

	1880.	1890.	Increase.	Per cent.
Hartford	125,382	147,180	21,798	17.39
New Haven	156,523	209,058	52,535	33.56
New London	73,152	76,634	3,482	4.76
Fairfield	112,042	150,081	38,039	33.95
Windham	43,856	45,158	1,302	2.97
Litchfield	52,044	53,542	1,498	2.88
Middlesex	35,589	39,524	3,935	11.06
Tolland	24,112	25,081	969	4.02
The State	622,700	746,258	123,558	19.84

New Haven and Fairfield Counties show about an equal rate of growth, and very much in excess of any other county, their increase of population in the decade having been over 33 per cent. The counties which have gained the least are New London, Windham, Litchfield and Tolland, neither of them reaching quite 5 per cent. of increase, and of these Windham and Litchfield fall short of 3 per cent.

The following is a general summary of the Births, Marriages and Deaths in 1890:

BIRTHS.

Sex.		Parentage.	
Males	8,877	American	7,596
Females	8,409	Foreign	9,298
Not stated	108	Not stated	500
	17,394		17,394

Whole number of Births, 17,394.
Birth-rate per 1,000, 23.3.

NOTE.—If either parent is of foreign birth, the child is counted as of foreign parentage. In Table III, a closer analysis of the parentage is exhibited.

Marriages.

Both parties American	3,451
Both parties foreign	1,719
Husband American, wife foreign	505
Husband foreign, wife American	601
Not stated	8
Whole number of marriages	6,284
Husband non-resident of town where married	537
Both non-resident	187

Deaths.

Sex.		Nativity.	
Males	7,016	American	10,307
Females	6,642	Foreign	3,143
Not stated	7	Not stated	215
	13,665		13,665

Whole number of Deaths, 13,665.
Death-rate per 1,000 of population, 18.3.

There was one birth to every 42.8 of the population.
There was one marriage to every 118.7 of the population.
There was one person married to every 59.3 of the population.
There was one death to every 54.6 of the population.

The total number of births registered in Connecticut during the year 1890 was 17,394 ; of deaths, 13,665 ; so that the natural increase of population or excess of births over deaths was 3,729, being 918 less than in the previous year.

Towns in which the Deaths Exceeded the Births.

There are 168 towns in Connecticut. In 84, just one-half of them only, do the births exceed the deaths. Of the other half, in 7 towns the births and deaths are equal, and in 77 towns there were more deaths than births. The total population of the towns in which the deaths were more than births, was only 123,017, or less than one-sixth of the whole population of the State.

The loss in the towns in which the deaths were more than the births amounted to 527, divided as follows :

In 27 towns of less than 1,000 inhabitants the loss was . .	132
In 30 towns of between 1,000 and 2,000 inhabitants the loss was	210
In 11 towns of between 2,000 and 3,000 inhabitants the loss was	103
In 7 towns of between 3,000 and 4,000 inhabitants the loss was	75
In 1 town of between 4,000 and 5,000 inhabitants the loss was	7
Total, ...	527

There was no natural loss of population in any town of more than 5,000 population.

The towns in which the registration shows this excess of deaths over births are the following :

HARTFORD COUNTY.

Towns.	Population.	Births.	Deaths.	Loss.
Berlin	2,600	34	42	8
Bloomfield	1,308	20	21	1
Glastonbury	3,457	64	69	5
Hartland	565	4	8	4
Marlborough	582	10	11	1
Newington	953	8	10	2
Plainville	1,993	28	31	3
Rocky Hill	1,069	25	31	6
South Windsor	1,736	17	22	5
West Hartford	1,930	20	32	12
Windsor	2,954	45	63	18
	19,147	275	340	65

NEW HAVEN COUNTY.

Towns.	Population.	Births.	Deaths.	Loss.
Bethany	550	4	9	5
Cheshire	1,929	18	31	13
East Haven	955	10	14	4
Hamden	3,882	60	74	14
Madison	1,429	21	29	8
Middlebury	566	9	21	12
Milford	3,811	55	60	5
North Haven	1,862	21	28	7
Orange	4,537	70	77	7
Prospect	445	5	12	7
Southbury	1,089	21	23	2
Woodbridge	926	14	16	2
	21,981	308	394	86

New London County.

Towns.	Population.	Births.	Deaths.	Loss.
East Lyme	2,048	35	36	1
Griswold	3,113	59	71	12
Lebanon	1,670	24	31	7
Ledyard	1,183	10	16	6
Lisbon	548	8	15	7
Lyme	977	15	21	6
Montville	2,344	46	48	2
North Stonington	1,463	20	28	8
Old Lyme	1,319	27	28	1
Preston	2,555	31	33	2
Sprague	1,106	13	26	13
Voluntown	1,060	21	24	3
Waterford	2,661	27	47	20
	22,047	336	424	88

Fairfield County.

Towns.	Population.	Births.	Deaths.	Loss.
Brookfield	989	24	26	2
Darien	2,276	20	31	11
Monroe	994	10	24	14
Newtown	3,539	47	65	18
Sherman	668	13	14	1
Trumbull	1,453	18	26	8
Weston	772	10	14	4
Westport	3,715	52	72	20
Wilton	1,722	26	32	6
	16,128	220	304	84

Windham County.

Towns.	Population.	Births.	Deaths.	Loss.
Ashford	778	13	15	2
Canterbury	947	11	24	13
Chaplin	542	4	9	5
Eastford	561	8	11	3
Sterling	1,051	13	25	12
Woodstock	2,309	30	52	22
	6,188	79	136	57

Litchfield County.

Towns.	Population.	Births.	Deaths.	Loss.
Barkhamsted	1,130	18	26	8
Bridgewater	617	8	13	5
Cornwall	1,283	15	20	5
Canaan	970	14	19	5
Litchfield	3,304	49	50	1
Norfolk	1,546	16	32	16
Roxbury	936	23	25	2
Woodbury	1,815	31	36	5
	11,601	174	221	47

Middlesex County.

Towns.	Population.	Births.	Deaths.	Loss.
Chatham	1,949	31	40	9
Chester	1,301	17	23	6
Clinton	1,384	14	31	17
Cromwell	1,987	43	48	5
Durham	856	12	13	1
East Haddam	2,599	44	49	5
Essex	2,035	35	37	2
Haddam	2,095	35	47	12
Killingworth	582	9	13	4
Saybrook	1,484	13	20	7
Westbrook	874	9	17	8
	17,146	262	338	76

Tolland County.

Towns.	Population.	Births.	Deaths.	Loss.
Andover	401	5	7	2
Columbia	740	15	21	6
Coventry	1,875	29	35	6
Ellington	1,539	23	29	6
Mansfield	1,911	21	27	6
Somers	1,407	16	17	1
Willington	906	12	17	5
	8,779	121	153	32

In the following towns the number of registered births and deaths were equal, viz: Bozrah, Fairfield, Franklin, New Hartford, Stratford, Suffield, Warren.

The following table gives a summary of the Vital Statistics of the State from 1848, the date of the first Registration Report, up to the present time.

TABLE I.

VITAL STATISTICS FROM 1848 TO 1891.

Year.	Births.	Birth-rate per 1,000.	Mar-riages.	Deaths.	Death-rate per 1,000.	Excess of Births over Deaths.	Divorces.	No. Marriages to each Divorce.
1848	6,850	20	2,816	4,379	12.4	2,471	---	----
1849	7,238	20	2,920	5,049	14	2,189	---	----
1850	7,578	20.4	2,884	5,170	14	2.408	---	----
1851	8,362	22	2,995	4,767	13	3,595	---	----
1852	8,302	21.4	3,136	5,596	14.4	2,706	---	----
1853	8,439	21.3	3,202	5,646	14.2	2,793	---	----
1854	10,012	24	4,286	6.094	14.6	3,918	---	----
1856	11,139	25	4,089	6,324	14.9	4,815	---	----
1857	11,355	26	3,747	6,585	16	4,770	---	----
1858	11,299	25	3,737	6,618	15.6	4,681	---	----
1859	11,259	25	3,778	6,533	15	4,726	--	----
1860	11,873	26	4,036	7,602	16.3	4,271	310	13
1861	11,934	25	3,757	7,735	16.5	4,199	275	13.9
1862	10,803	23	3,701	8,541	18	2,262	257	14
1863	9,885	21	3,467	8,442	18	1,443	291	12
1864	9,734	20	4,107	9,109	19	625	426	9.6
1865	10,202	20.8	4,460	7,950	16	2,252	404	11
1866	11,623	23	4,978	7,520	15	4,103	488	10
1867	12,029	23.2	4,779	7,343	14.3	4,686	459	10.4
1868	12,469	23.4	4,734	7,549	15	4,920	478	9.9
1869	12,481	23.5	4,754	8,417	15.6	4,064	491	9.6
1870	13,136	24.2	4,871	8,895	15	4,241	408	11.9
1871	13,114	24	4,882	8,166	14.2	4,948	409	11.9
1872	13,805	25.3	5.023	9,970	18	3,835	464	10.8
1873	14,087	25.6	4,841	9,822	17.4	4,265	457	10.6
1874	14,450	26.2	4,694	8,939	17.2	5,511	492	9.5
1875	14,328	26	4,535	9,883	17	4.495	476	9.4
1876	13,800	25	4.320	10,187	17.5	3,613	396	10.9
1877	14,072	26	4,319	9,696	16	4,376	427	10.1
1878	13,499	24	4.315	9,352	15	4,147	401	10.7
1879	14,051	22.4	4,373	9,394	15	4,657	316	13.7
1880	13,829	22.2	4,745	10,408	16.7	3,421	332	14.2
1881	14,616	22.4	4,850	10.907	17.4	3,709	404	12
1882	14,938	23.9	5,329	11,622	18.7	3,316	392	13.5
1883	15,856	25.4	5,440	11,943	19.1	3,913	433	12.6
1884	15,758	23	5,394	11,351	16.6	4,407	360	14.7
1885	15,496	22.7	5,091	12,033	17.6	3,463	363	13.3
1886	15,934	22.2	5,497	11,616	16.2	4,318	387	14.2
1887	16,583	22.8	5,788	12,385	17	4,198	387	14.9
1888	16,878	22.2	5,969	12,980	17.1	3,898	430	13.8
1889	17,176	23.4	5,744	12,529	17	4,647	536	10.7
1890	17,394	23.3	6,284	13,665	18.3	3,729	477	1.31

TABLE II.—HARTFORD COUNTY.

BIRTHS, MARRIAGES AND DEATHS IN THE SEVERAL TOWNS FOR THE YEAR ENDING DEC. 31, 1890.

TOWNS.	Population by Census.	BIRTHS. Sex. Male.	Female.	Not stated.	Total.	Birth-rate per 1,000.	Parentage. Both Amer.	Both Foreign.	Am. Mother For. Father.	Am. Father For. Mother.	Both For. of diff. Nations.	Not stated.	MARRIAGES. Nativity. Both Amer.	Both Foreign.	Husb. Amer. Wife Foreign.	Husb. For. Wife Amer.	Not stated.	Total.	Husband non-resident.	Both non-resident.	DEATHS. Sex. Male.	Female.	Not stated.	Total.	Nativity. American.	Foreign.	Not stated.	Death-rate per 1,000.
Hartford	53,230	649	570	11	1230	23.1	497	405	124	106	98		293	129	52	51		525	69	29	593	545		*1138	790	348		20.2
Avon	1,182	11	10		21	17.7	13	4	1	2	1		9	2	2			12			4	12		16	13	3		13.5
Berlin	2,600	20	14		34	13.0	26	6	2				9	1		3		13	1		21	21		42	34	6	2	16.1
Bloomfield	1,308	10	10		20	15.2	17	3					4					4			12	9		21	18	3		16.0
Bristol	7,382	81	74	1	156	21.1	54	79	14	8	1		35	9	5	2		51	3		62	71		133	102	27	4	18.0
Burlington	1,302	31	14		45	34.5	5	31	5	4			1	2				3			18	16		34	24	10		26.1
Canton	2,500	29	24		53	21.2	25	26	2				16	6	1	5		28	1	5	29	23		52	36	16		20.8
East Granby	661	6	7		13	19.5	10		1	2											7	5		12	10	2		18.1
East Hartford	4,455	52	41	1	94	21.1	43	26	9	15	1		21	6	4	3		34	4	1	33	34		67	57	10		15.1
East Windsor	2,890	32	21		53	18.3	28	9	11	5			17	4	3	1		25	1	3	21	15		36	29	7		12.4
Enfield	7,199	88	75		163	22.6	55	80	15	5	8		37	32	5	3		77	22	18	74	63		137	92	45		19.0
Farmington	3,179	26	20		46	14.4	29	6	5	5	1		14		3	2		19	1		20	19		39	32	7		12.2
Glastonbury	3,457	26	38		64	18.5	38	18	4	4			14	3	2	2		21	1		30	39		69	60	9		19.9
Granby	1,261	13	7		20	15.9	19	1					11			1		12		2	6	12		18	17	1		14.3
Hartland	565	2	2		4	7.0	3				1		3					3	1		6	2		8	8			14.1
Manchester	8,222	120	80	2	202	24.5	58	119	13	6	6		24	52	3	10		89	3		72	81		153	100	53		18.6
Marlborough	582	5	5		10	17.1	5	4			1			1				1			5	6		11	9	2		18.9
New Britain	19,007	282	278		560	29.4	173	223	48	32	13	71	73	60	6	21		160	10	1	158	141		299	188	109	2	15.6
Newington	953	1	7		8	8.3	4	3	1				2					2			6	4		10	8	2		10.4
Plainville	1,993	16	12		28	14.0	21	1	5	1			10	3	2	1		16	1	1	20	11		31	24	6	1	15.5
Rocky Hill	1,069	7	18		25	23.4	21	1		3			6	4				10	1		13	18		31	28	3		29.0
Simsbury	1,874	20	25	1	46	24.5	34	7	1	3	1		7	2	1	1		11	2	2	19	12		31	20	11		16.5
Southington	5,501	45	50		95	17.2	49	23	9	9	5		19	9	10	4		42	1	1	53	41		94	74	20		17.0
South Windsor	1,736	5	12		17	9.2	14	3					7	1		1		9			10	12		22	16	6		12.6
Suffield	3,169	21	27	3	51	16.0	36	7	5	2	1		11	2				13	3	1	27	24		51	45	6		16.0
West Hartford	1,930	7	13		20	10.3	10	8	1	1			4	2	1			7			14	18		32	24	7	1	16.5
Wethersfield	2,279	21	11		32	14.0	19	9	1	3			8	3	1	1		13			21	17		*38	36	2		12.3
Windsor	2,954	27	18		45	15.2	31	4	4	5	1		13	3	3			19	8	2	28	35		63	50	13		21.2
Windsor Locks	2,758	38	25		63	22.8	25	24	6	6	2		12	4	6	2	1	25	3	8	29	29		58	31	27		21.0
Total	147,180	1691	1508	19	3218	21.8	1362	1130	287	227	141	71	680	340	109	114	1	1244	136	74	1411	1335		2746	1975	761	10	18.6

* Deaths of non-residents in public institutions: Hartford, 59; Wethersfield, 10; deducted from total in estimating death-rate.

TABLE II.—NEW HAVEN COUNTY.

TOWNS.	Population by Census.	BIRTHS. Sex. Male.	Female.	Not stated.	Total.	Birth-rate per 1,000.	Parentage. Both Amer.	Both Foreign.	Am. Mother, For. Father.	Am. Father, For. Mother.	Both For. of diff. Nations.	Not stated.	MARRIAGES. Nativity. Both Amer.	Both Foreign.	Husb. Amer. Wife Foreign.	Husb. For. Wife Amer.	Not stated.	Total.	Husband non-resident.	Both non-resident.	DEATHS. Sex. Male.	Female.	Not stated.	Total.	Nativity. American.	Foreign.	Not stated.	Death-rate per 1,000.
New Haven	86,045	1216	1206	11	2433	28.2	738	883	196	147	78	391	441	269	64	72	7	853	49	12	895	848		*1743	1209	489	45	19.2
Ansonia	10,342	172	170		342	33.0	108	161	40	21	12		43	37	4	11		95	4		112	119		231	169	62		22.3
Beacon Falls	505	6	4		10	19.8	5	4	1				1					1		1		1		1	1			1.9
Bethany	550	2	2		4	7.2	3	1					2		1			3	2		5	4		9	7	2		16.3
Branford	4,460	56	60	2	118	26.4	38	55	12	8	5		16	8	1	1		26	2		44	38		82	64	18		18.4
Cheshire	1,929	11	7		18	9.3	11	6	1				8	2	1	1		12			16	15		31	26	5		16.0
Derby	5,969	88	66	10	164	27.4	62	69	5	21	7		38	21	6	14		79	1		57	49	1	107	81	23	3	17.9
East Haven	955	5	5		10	10.4	7	1		1	1		1	1		1		3			6	8		14	12	2		14.6
Guilford	2,780	34	23		57	20.5	35	13	5	3	1		17	4	1	3		25	3		26	28		54	48	4	2	19.4
Hamden	3,882	29	31		60	15.4	37	11	7	1	4		11	1		1		13			45	29		74	61	13		19.0
Madison	1,429	11	10		21	14.5	15	3	2	1			8					8	1		19	10		29	27	2		20.2
Meriden	25,423	364	345	1	710	27.9	212	341	72	52	32	1	100	97	7	36		240	13	5	203	195		398	279	116	3	15.6
Middlebury	566	3	6		9	15.9	8			1			2		2			4			10	11		21	21			37.1
Milford	3,811	19	36		55	14.4	33	12	2	4	4		11	6	2			19	1		32	28		60	48	8	4	15.7
Naugatuck	6,218	81	90	1	172	27.6	66	64	21	18	3		22	29	3	11		65	2		59	59		118	84	33	1	18.9
North Branford	825	5	8		13	15.7	11	2					7					7			4	5		9	9			10.8
North Haven	1,862	6	15		21	11.2	12	6	3				6					6			14	14		28	22	4	2	15.0
Orange	4,537	32	38		70	15.4	39	20	6	3	2		17	3	1	3		24	3		37	40		77	66	11		16.9
Oxford	902	12	10		22	24.3	19	2			1		7					7			9	8		17	15	2		18.8
Prospect	445	5			5	11.2	3			1		1	1					1			7	5		12	12			26.9
Seymour	3,300	39	32		71	21.5	28	28	4	10	1		20	9	2	2		33	3	5	22	35		57	52	5		17.3
Southbury	1,089	11	10		21	19.2	10	5	2	4			5		2			7			10	13		23	20	1	2	21.1
Wallingford	6,584	86	82	7	175	26.5	76	46	26	16	8	3	31	12	8	10		61	4		57	46		103	67	30	6	15.6
Waterbury	33,202	452	514	10	976	29.5	361	400	93	87	35		147	100	35	39		321	13	2	347	279		*626	408	200	18	18.7
Wolcott	522	11	3		14	26.8	10	3	1				1					1			6	2		8	7	1		15.3
Woodbridge	926	6	8		14	15.1	9		3	2			4					4	1		11	5		16	15	1		17.2
Total	209,058	2762	2781	42	5585	26.7	1956	2136	502	401	194	396	967	599	140	205	7	1918	102	25	2053	1894	1	3948	2830	1032	86	18.8

*Deaths of non-residents in public institutions: New Haven, 31; Waterbury, 8; deducted from total in estimating death-rate.

TABLE II.—NEW LONDON COUNTY.

TOWNS.	Population by Census	BIRTHS. Sex. Male.	Female.	Not stated.	Total.	Birth-rate per 1,000.	Parentage. Both Amer.	Both Foreign.	Am. Mother. For. Father.	Am. Father. For. Mother.	Both For. of diff. Nations.	Not stated.	MARRIAGES. Nativity. Both Amer.	Both Foreign.	Husb. Amer. Wife Foreign.	Husb. For. Wife Amer.	Not stated.	Total.	Husband non-resident.	Both non-resident.	DEATHS. Sex. Male.	Female.	Not stated.	Total.	Nativity. American.	Foreign.	Not stated.	Death-rate per 1,000.
New London	13,757	170	170	..	340	24.7	177	92	35	24	12	...	95	38	17	15	..	165	19	8	140	128	..	268	212	56	..	19.1
Bozrah	1,005	9	8	..	17	16.8	11	4	...	1	1	...	4	...	1	1	..	6	...	...	8	9	..	17	14	3	..	16.8
Colchester	2,988	35	32	..	67	22.4	38	15	7	5	2	...	14	2	2	6	..	24	3	...	29	29	..	58	47	11	..	19.4
East Lyme	2,048	17	18	..	35	17.0	21	9	3	1	1	...	8	1	3	3	..	15	...	...	23	13	..	36	26	7	3	17.5
Franklin	585	3	3	..	6	10.2	4	1	...	1	...	...	1	...	...	...	..	1	...	...	5	1	..	6	5	1	..	10.2
Griswold	3,113	33	26	..	59	18.9	17	28	7	5	2	...	9	31	3	1	..	44	4	1	42	29	..	71	54	17	..	22.8
Groton	5,539	55	51	..	106	19.1	77	16	3	7	3	...	28	2	5	5	..	40	6	...	51	44	..	95	94	1	..	17.1
Lebanon	1,670	10	14	..	24	14.4	21	...	1	1	1	...	9	1	...	...	..	10	...	...	14	17	..	31	29	2	..	18.5
Ledyard	1,183	8	2	..	10	8.4	9	...	1	...	...	...	4	...	...	...	..	4	...	...	11	5	..	16	16	...	..	13.5
Lisbon	548	2	6	..	8	14.6	6	...	...	2	...	...	3	...	...	...	..	3	..	...	7	8	..	15	13	2	..	27.3
Lyme	977	5	10	..	15	15.3	12	3	...	...	...	...	5	...	...	...	..	5	...	...	7	14	..	21	20	1	..	21.4
Montville	2,344	25	21	..	46	19.6	27	12	3	4	...	...	10	8	...	...	..	18	1	...	28	20	..	48	40	8	..	20.4
Norwich	23,048	301	248	..	549	23.8	201	220	61	49	18	...	101	62	16	25	..	204	21	2	223	213	..	436	323	113	..	18.9
No. Stonington	1,463	7	12	1	20	13.6	17	3	...	...	...	...	10	1	2	2	..	15	3	...	12	16	..	28	21	...	7	19.1
Old Lyme	1,319	10	17	..	27	20.4	22	2	...	3	...	...	10	...	...	1	..	11	1	...	14	14	..	28	20	6	2	21.2
Preston	2,555	16	15	..	31	12.1	20	6	3	1	1	...	17	1	1	...	..	19	...	...	20	13	..	33	29	4	..	12.9
Salem	481	4	6	..	10	20.7	7	2	...	1	...	...	3	...	...	1	..	4	2	...	4	5	..	9	9	...	..	18.7
Sprague	1,106	6	6	1	13	11.7	3	4	5	1	...	...	5	...	...	...	..	5	...	...	9	17	..	26	22	4	..	23.5
Stonington	7,184	69	66	1	136	18.9	87	26	7	13	3	...	32	4	4	1	..	41	8	2	72	59	..	131	93	38	..	18.2
Voluntown	1,060	14	7	..	21	20.0	13	7	...	1	...	...	12	1	1	...	..	14	...	...	11	13	..	24	22	2	..	22.6
Waterford	2,661	12	15	..	27	10.1	13	8	...	4	2	...	10	...	1	1	..	12	...	...	23	24	..	47	46	1	..	17.6
Total	76,634	811	753	3	1567	20.4	803	458	136	124	46	...	390	152	56	62	..	660	68	13	753	691	..	1444	1155	277	12	18.8

TABLE II.—FAIRFIELD COUNTY.

TOWNS.	Population by Census.	BIRTHS. Sex. Male.	Female.	Not stated.	Total.	Birth-rate per 1,000.	Parentage. Both Amer.	Both Foreign.	Am. Mother. For. Father.	Am. Father. For. Mother.	Both For. of diff. Nations.	Not stated.	MARRIAGES. Nativity. Both Amer.	Both Foreign.	Husb. Amer. Wife Foreign.	Husb. For. Wife Amer.	Not stated.	Total.	Husband non-resident.	Both non-resident.	DEATHS. Sex. Male.	Female.	Not stated.	Total.	Nativity. American.	Foreign.	Not stated.	Death-rate per 1,000.
Danbury	19,473	278	228	4	510	26.6	260	158	43	29	15	5	63	28	14	9		114	4		156	130		286	225	45	16	14.6
Bridgeport	48,866	754	727	5	1486	30.4	544	621	140	114	67		253	181	49	65		548	36	15	489	425		*914	644	255	15	18.3
Bethel	3,401	46	41		87	25.5	56	19	2	9	1		19	2		4		25	4		24	28		52	41	10	1	15.2
Brookfield	989	14	10		24	24.2	16	7		1			4	2				6			13	13		26	24	2		26.2
Darien	2,276	12	8		20	8.7	10	4	1	3	2		6					6	1		37	18		*55	43	12		13.6
Easton	1,001	8	11		19	18.9	14	4		1			4					4			7	11		18	18			17.9
Fairfield	3,868	27	30		57	14.7	33	15	2	7			16	7	1	1		25	5		27	30		57	53	4		14.7
Greenwich	10,131	89	89		178	17.5	91	53	5	16	13		33	6	1	4		44	11		74	72		146	113	33		14.4
Huntington	4,006	38	38		76	18.9	41	19	8	2	6		14	3		1		18	1		29	35		64	52	12		15.9
Monroe	994	3	7		10	10.0	10						15					15	3		11	13		24	22	2		24.1
New Canaan	2,701	35	25		60	22.2	43	6	7	2	2		6	1		1		8	3		29	20		49	46	3		18.1
New Fairfield	670	5	12		17	25.3	13	4					2					2		1	2	6		8	7		1	12.0
Newtown	3,539	20	27		47	13.2	25	10	4	6	2		13	1				14			32	33		65	53	12		18.3
Norwalk	17,747	210	206	7	423	23.8	260	91	26	22	18	6	92	27	9	18		146	11	4	161	155	1	317	240	71	6	17.8
Redding	1,546	13	22		35	22.6	26	5	3	1			10	1	2	1		14		1	17	12		29	27	2		18.7
Ridgefield	2,235	29	26		55	24.5	46	4	1	3	1		8	2	1			11	1	1	21	23	1	45	40	5		20.1
Sherman	668	2	11		13	19.4	10	3					1					1			6	8		14	14			20.9
Stamford	15,700	200	203	10	413	26.3	189	127	42	25	20	10	57	32	15	16		120	22	9	126	141		267	212	46	9	17.0
Stratford	2,608	20	26		46	17.6	35	4	4	3			8		1			9	1		24	22		46	41	5		17.6
Trumbull	1,453	9	9		18	12.3	14	2	1	1			9					9			12	14		26	23	3		17.8
Weston	772	8	2		10	12.9	5	3	1		1		2	2		1		5			13	1		14	14			18.1
Westport	3,715	36	26		62	16.6	35	19	4	4			13	6	4			23	3		28	44		72	68	3	1	19.3
Wilton	1,722	15	10	1	26	15.0	15	4	4	1	2		5	1				6	2	2	18	14		32	29	3		18.5
Total	150,081	1871	1794	27	3692	24.6	1791	1182	298	250	150	21	653	302	97	121		1173	108	33	1356	1268	2	2626	2049	528	49	17.4

* Deaths of non-residents in public institutions: Bridgeport, 16; Darien, 24; deducted from total in estimating death-rate.

TABLE II.—WINDHAM COUNTY.

TOWNS.	Population by Census.	BIRTHS. Sex. Male.	Female.	Not stated.	Total.	Birth-rate per 1,000.	Parentage. Both Amer.	Both Foreign.	Am. Mother. For. Father.	Am. Father. For. Mother.	Both For. of diff. Nations.	Not stated.	MARRIAGES. Nativity. Both Amer.	Both Foreign.	Husb. Amer. Wife Foreign	Husb. For. Wife Amer.	Not stated.	Total.	Husband non-resident.	Both non-resident.	DEATHS. Sex. Male.	Female.	Not stated.	Total.	Nativity. American.	Foreign.	Not stated.	Death-rate per 1,000.
Brooklyn	2,628	32	20	..	52	19.7	17	29	1	5	..	..	3	7	2	3	..	15	1	..	25	22	..	47	38	9	..	17.8
Ashford	778	5	8	..	13	16.7	12	1	..	..	..	..	5	1	..	..	..	6	..	..	11	4	..	15	15	..	..	19.1
Canterbury	947	6	5	..	11	11.6	7	2	1	1	..	..	1	..	..	..	..	1	1	..	15	9	..	24	21	3	..	25.3
Chaplin	542	4	..	..	4	7.3	4	..	..	..	..	..	4	..	..	..	..	4	..	..	5	4	..	9	9	..	..	16.6
Eastford	561	7	1	..	8	14.2	6	..	2	..	..	..	6	..	..	..	..	6	..	..	6	5	..	11	9	2	..	19.6
Hampton	632	3	6	1	10	15.8	9	1	..	..	..	..	6	..	1	..	..	7	2	..	6	3	..	9	7	1	1	14.2
Killingly	7,027	92	87	..	179	25.4	65	81	18	8	7	..	26	40	7	..	..	73	7	2	53	93	..	146	119	27	..	20.7
Plainfield	4,582	52	49	..	101	22.0	32	41	15	12	1	..	14	11	3	2	..	30	7	1	34	51	..	85	66	17	2	18.5
Pomfret	1,471	18	22	..	40	27.1	25	9	2	3	1	..	9	3	..	..	..	12	1	..	15	17	..	32	27	5	..	21.7
Putnam	6,512	98	98	6	202	31.0	67	86	26	22	..	1	29	16	8	5	..	58	10	3	66	47	..	113	86	23	4	17.3
Scotland	506	3	6	..	9	17.7	9	..	..	..	..	..	1	..	..	..	..	1	..	..	5	3	..	8	7	1	..	15.8
Sterling	1,051	6	7	..	13	12.3	9	1	3	..	..	..	13	..	1	1	..	15	4	4	11	14	..	25	22	3	..	23.7
Thompson	5,580	59	52	1	112	20.0	17	69	8	13	2	3	10	17	2	10	..	39	6	3	45	41	..	86	65	21	..	15.4
Windham	10,032	111	93	2	206	20.5	82	80	25	15	4	..	50	26	10	14	..	100	5	..	90	91	..	181	138	34	9	18.0
Woodstock	2,309	16	14	..	30	12.9	24	5	..	..	..	1	17	1	..	1	..	19	3	1	22	30	..	52	42	7	3	22.5
Total	45,158	512	468	10	990	21.9	385	405	101	79	15	5	194	122	34	36	..	386	47	14	409	434	..	843	671	153	19	18.6

TABLE II.—LITCHFIELD COUNTY.

TOWNS.	Population by Census.	BIRTHS. Sex. Male.	Female.	Not stated.	Total.	Birth-rate per 1,000.	Parentage. Both Amer.	Both Foreign.	Am. Mother. For. Father.	Am. Father. For. Mother.	Both For. of diff. Nations.	Not stated.	MARRIAGES. Nativity. Both Amer.	Both Foreign.	Husb. Amer. Wife Foreign.	Husb. For. Wife Amer.	Not stated.	Total.	Husband non-resident.	Both non-resident.	DEATHS. Sex. Male.	Female.	Not stated.	Total.	Nativity. American.	Foreign.	Not stated.	Death-rate per 1,000.
Litchfield	3,304	19	30	..	49	14.8	31	9	3	4	2	...	22	1	3	1	..	27	2	1	19	31	..	50	42	8	..	15.1
Barkhamsted	1,130	10	8	..	18	15.9	17	1	...	...	...	...	4	1	...	...	..	5	...	...	9	17	..	26	25	1	..	23.0
Bethlehem	543	10	4	..	14	25.7	10	...	2	2	...	...	1	...	...	1	..	2	...	...	5	4	..	9	9	...	..	16.5
Bridgewater	617	6	2	..	8	12.9	6	2	...	...	...	...	3	1	...	1	..	5	1	...	8	5	..	13	11	2	..	21.0
Canaan	970	8	6	..	14	14.4	12	...	1	1	...	...	3	...	1	...	..	4	...	...	7	12	..	19	16	3	..	19.5
Colebrook	1,098	7	6	..	13	11.8	10	1	2	...	...	...	3	1	...	...	..	4	...	...	7	5	..	12	10	2	..	10.9
Cornwall	1,283	8	7	..	15	11.6	13	...	1	1	...	...	12	1	...	1	..	14	2	...	10	10	..	20	19	1	..	15.5
Goshen	972	12	7	..	19	19.5	15	2	1	...	1	...	5	...	...	...	..	5	1	...	7	10	..	17	15	2	..	17.4
Harwinton	943	10	9	..	19	20.1	10	5	2	...	2	...	4	...	...	...	..	4	...	...	4	9	..	13	13	...	..	13.7
Kent	1,383	15	13	..	28	20.2	24	4	...	...	...	...	11	2	...	...	..	13	1	...	11	12	..	23	22	1	..	16.6
Morris	584	6	4	..	10	17.1	7	1	1	1	...	...	5	...	...	...	..	5	...	...	3	1	..	4	3	1	..	6.8
New Hartford	3,160	40	29	2	71	22.4	32	33	3	1	1	1	4	15	2	2	..	23	2	...	29	42	..	71	40	24	7	22.4
New Milford	3,917	47	37	2	86	21.9	64	13	6	1	1	1	27	4	...	2	..	33	4	2	30	31	..	61	47	5	9	15 5
Norfolk	1,546	7	8	1	16	10.3	12	3	.	1	...	...	4	1	...	...	..	5	...	...	17	13	2	32	26	6	..	20.6
North Canaan	1,683	16	11	..	27	16.0	16	6	3	1	1	...	7	2	1	1	..	11	...	3	12	11	..	23	20	3	..	13.6
Plymouth	2,147	24	20	..	44	20.4	32	9	1	1	1	...	6	8	...	...	..	14	...	1	16	13	..	29	24	5	..	13.5
Roxbury	936	18	5	..	23	24.5	14	5	2	2	...	...	5	...	...	...	..	5	...	...	16	9	..	25	22	3	..	26.7
Salisbury	3,420	30	41	..	71	20.7	43	12	10	6	...	...	13	3	1	...	..	17	2	...	33	30	..	63	54	9	..	18.4
Sharon	2,149	19	24	..	43	20.0	30	6	3	4	...	...	6	1	...	1	..	8	1	...	20	18	..	38	36	2	..	17.6
Thomaston	3,278	54	39	..	93	28.4	43	34	9	3	3	1	15	8	3	3	..	29	1	...	25	18	..	43	30	13	..	13.1
Torrington	6,048	64	61	2	127	20.9	70	32	10	9	6	...	19	16	4	1	..	40	2	6	39	41	1	81	59	16	6	13.3
Warren	477	3	3	..	6	12.5	5	1	...	...	...	...	3	...	...	...	..	3	...	...	4	2	..	6	6	...	..	12.5
Washington	1,633	16	13	..	29	17.7	19	10	...	...	...	...	9	2	2	...	..	13	2	2	13	13	..	26	21	5	..	15.9
Watertown	2,323	27	26	..	53	22.8	33	5	5	8	2	...	15	6	4	1	..	26	1	...	14	16	..	30	21	9	..	12.9
Winchester	6,183	49	50	..	99	16.0	67	14	6	9	3	...	36	7	8	5	..	56	5	...	49	43	..	92	72	17	3	14.8
Woodbury	1,815	20	11	..	31	17.0	25	3	3	...	...	...	12	...	1	...	..	13	1	...	19	17	..	36	29	2	5	19.8
Total	53,542	545	474	7	1026	19.1	660	211	74	55	23	3	254	80	30	20	..	384	28	15	426	433	3	862	692	140	30	16.0

TABLE II.—MIDDLESEX COUNTY.

TOWNS.	Population by Census.*	BIRTHS. Sex. Male.	Female.	Not stated.	Total.	Birth-rate per 1,000.	Parentage. Both Amer.	Both Foreign.	Am. Mother. For. Father.	Am. Father. For. Mother.	Both For. of diff. Nations.	Not stated.	MARRIAGES. Nativity. Both Amer.	Both Foreign.	Husb. Amer. Wife Foreign.	Husb. For. Wife Amer.	Not stated.	Total.	Husband non-resident.	Both non-resident.	DEATHS. Sex. Male.	Female.	Not stated.	Total.	Nativity. American.	Foreign.	Not stated.	Death-rate per 1,000.
Middletown	15,205	148	166		314	20.6	147	102	43	15	7		69	20	8	8		105	11	1	168	163	1	*332	224	103	5	16.1
Haddam	2,095	20	15		35	16.7	16	14	2	2	1		18	3	1	2		24			27	20		47	40	7		22.4
Chatham	1,949	20	11		31	15.9	21	3	1	5	1		14			1		15	1		17	23		40	33	7		20.5
Chester	1,301	12	5		17	13.0	14	3					4	1		1		6	1	3	14	9		23	19	4		17.6
Clinton	1,384	3	11		14	10.1	13	1					9	1	1			11			20	11		31	31			22.3
Cromwell	1,987	24	19		43	21.6	14	16	5	5	3		10	2	3			15			30	18		48	36	12		24.1
Durham	856	8	4		12	14.0	10	2					7	1				8		1	7	6		13	12	1		15.1
East Haddam	2,599	23	21		44	16.9	31	5	3	4	1		15		2	2		19	6	1	18	31		49	48	1		18.0
Essex	2,035	15	20		35	17.1	27	4	2	2			7	4	2	2		15			17	20		37	29	8		15.2
Killingworth	582	7	2		9	15.4	9						5					5			6	7		13	13			22.3
Middlefield	1,002	8	5		13	12.9	11	1		1			1			2		3			5	6		11	8	2	1	10.9
Old Saybrook	1,484	14	20		34	22.9	28	6					13	1	1	1		16	1		15	11		26	21	5		17.5
Portland	4,687	94	80		174	37.1	37	99	19	13	6		9	37	1	4		51	2	1	48	50		98	69	29		20.9
Saybrook	1,484	5	8		13	8.7	11	1	1				7	1				8			10	10		20	20			13.4
Westbrook	874	3	6		9	10.2	9						4		1			5	1	1	11	6		17	14	3		19.4
Total	39,524	404	393		797	20.1	398	257	76	47	19		192	71	20	23		306	23	8	413	391	1	805	617	182	6	20.1

* Deaths of non-residents in public institutions: Middletown, 86; deducted from total in estimating death-rate.

TABLE II.—TOLLAND COUNTY.

TOWNS.	Population by Census	BIRTHS. Sex. Male.	Female.	Not stated.	Total.	Birth-rate per 1,000.	Parentage. Both Amer.	Both Foreign.	Am. Mother. For. Father.	Am. Father. For. Mother.	Both For. of diff. Nations.	Not stated.	MARRIAGES. Nativity. Both Amer.	Both Foreign.	Husb. Amer. Wife Foreign.	Husb. For. Wife Amer.	Not stated.	Total.	Husband non-resident.	Both non-resident.	DEATHS. Sex. Male.	Female.	Not stated.	Total.	Nativity. American.	Foreign.	Not stated.	Death-rate per 1,000.
Tolland	1,037	13	2		15	14.4	11	1	1	2			8	1				9			7	6		13	8	5		12.5
Andover	401	1	4		5	12.4	5						6					6	1		5	2		7	7			17.4
Bolton	452	2	3		5	11.0	3	2					3		1			4			3	1		4	4			8.8
Columbia	740	8	7		15	20.2	9	2	2	2			5					5	1		10	11		21	19	2		28.3
Coventry	1,875	17	12		29	15.4	19	2	6	2			15	3	2			20	2	1	18	17		35	31	3	1	18.6
Ellington	1,539	14	9		23	14.8	12	6	2	1	2		8	2	2			12	2	2	14	15		29	26	3		18.8
Hebron	1,039	9	11		20	19.2	15	3			2		2	1	1	1		5	1		8	7		15	14	1		14.4
Mansfield	1,911	9	12		21	10.9	15	3	2	1			10					10	1		9	18		27	26	1		14.1
Somers	1,407	9	7		16	11.3	9	1	1	3	2		4	3				7			10	7		17	16	1		12.0
Stafford	4,535	64	53		117	25.7	56	38	13	9	1		28	5	1	8		42	8	1	40	30		70	61	9		15.4
Union	431	1	6		7	16.2	6		1				1	1				2			3	1		4	4			9.2
Vernon	8,808	127	107		234	26.5	75	87	35	25	8	4	30	34	12	10		86	9	1	57	75		132	88	43	1	14.9
Willington	906	7	5		12	13.2	6	1	3	2			1	3		1		5			11	6		17	14	2	1	18.7
Total	25,081	281	238		519	20.6	241	146	66	47	15	4	121	53	19	20		213	25	5	195	196		391	318	70	3	15.5

TABLE III.—RECAPITULATION BY COUNTIES.

COUNTIES.	Population by Census.	BIRTHS. Sex. Male.	Female.	Not stated.	Total.	Birth-rate per 1,000.	Parentage. Both American.	Both Foreign.	Am. Mother. For. Father.	Am. Father. For. Mother.	Both For. of diff. Nations.	Not stated.	MARRIAGES. Nativity. Both American.	Both Foreign.	Husb. Amer. Wife Foreign.	Husb. Foreign. Wife American.	Not stated.	Total.	Husband non-resident.	Both non-resident.	DEATHS. Sex. Male.	Female.	Not stated.	Total.	Nativity. American.	Foreign.	Not stated.	Death-rate per 1,000.
HARTFORD ..	147,180	1691	1508	19	3218	21.8	1362	1130	287	227	141	71	680	340	109	114	1	1244	136	74	1411	1335	..	2746	1975	761	10	18.6
New Haven .	209,058	2762	2781	42	5585	26.7	1956	2136	502	401	194	396	967	599	140	205	7	1918	102	25	2053	1894	1	3948	2830	1032	86	18.8
New London.	76,634	811	753	3	1567	20.4	803	458	136	124	46	...	390	152	56	62	..	660	68	13	753	691	..	1444	1155	277	12	18.8
Fairfield	150,081	1871	1794	27	3692	24.6	1791	1182	298	250	150	21	653	302	97	121	..	1173	108	33	1356	1268	2	2626	2049	528	49	17.4
Windham ...	45,158	512	468	10	990	21 9	385	405	101	79	15	5	194	122	34	36	..	386	47	14	409	434	..	843	671	153	19	18.6
Litchfield ...	53,542	545	474	7	1026	19.1	660	211	74	55	23	3	254	80	30	20	..	384	28	15	426	433	3	862	692	140	30	16.0
Middlesex ...	39,524	404	393	...	797	20.1	398	257	76	47	19	...	192	71	20	23	..	306	23	8	413	391	1	805	617	182	6	20.1
Tolland	25,081	281	238	...	519	20.6	241	146	66	47	15	4	121	53	19	20	..	213	25	5	195	196	..	391	318	70	3	15.5
Total	746,258	8877	8409	108	17394	23.3	7596	5925	1540	1230	603	500	3451	1719	505	601	8	6284	537	187	7016	6642	7	13665	10307	3143	215	18.3

TABLE IV.

EXHIBITING THE NUMBER OF BIRTHS, BY SEXES, IN THE SEVERAL COUNTIES FOR EACH MONTH IN THE YEAR ENDING DECEMBER 31, 1890.

COUNTIES.	SEX.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Total.
Hartford	Male	129	147	161	144	158	111	139	136	163	128	146	129	1,691
	Female	126	122	147	111	127	120	138	131	132	106	119	129	1,508
	Not stated	2	3	2	....	2	1	....	1	....	3	2	3	19
		257	272	310	255	287	232	277	268	295	237	267	261	3,218
New Haven	Male	258	201	237	235	229	208	218	235	233	237	217	254	2,762
	Female	223	219	240	220	215	224	240	261	238	224	224	253	2,781
	Not stated	4	3	6	4	3	3	5	5	1	2	3	3	42
		485	423	483	459	447	435	463	501	472	463	444	510	5,585
New London	Male	74	57	64	66	69	71	74	71	69	66	69	61	811
	Female	61	50	73	56	57	64	71	65	76	47	72	61	753
	Not stated	1	....	....	....	....	1	....	1	....	....	....	....	3
		136	107	137	122	126	136	145	137	145	113	141	122	1,567
Fairfield	Male	176	147	156	128	151	145	161	169	163	173	139	163	1,871
	Female	173	115	134	150	140	141	157	164	167	139	144	170	1,794
	Not stated	4	3	3	1	1	1	4	1	1	2	4	2	27
		353	265	293	279	292	287	322	334	331	314	287	335	3,692
Windham	Male	50	35	42	50	39	41	46	46	39	41	44	39	512
	Female	41	33	49	36	44	32	41	39	34	36	53	30	468
	Not stated	1	....	1	....	1	3	1	....	....	1	1	1	10
		92	68	92	86	84	76	88	85	73	78	98	70	990
Litchfield	Male	44	51	49	47	40	44	45	50	42	38	39	56	545
	Female	43	37	37	30	42	43	44	52	51	31	26	38	474
	Not stated	....	....	....	1	....	....	1	1	1	....	1	2	7
		87	88	86	78	82	87	90	103	94	69	66	96	1,026
Middlesex	Male	30	23	44	36	42	35	27	47	19	36	26	39	404
	Female	35	32	33	23	35	35	37	26	31	33	34	39	393
	Not stated	....	....	....	....	....	....	....	....	....	....	....	....	......
		65	55	77	59	77	70	64	73	50	69	60	78	797
Tolland	Male	22	23	19	26	29	31	21	34	18	21	12	25	281
	Female	23	11	30	17	22	18	23	12	21	24	20	17	238
	Not stated	....	....	....	....	....	....	....	....	....	....	....	....	......
		45	34	49	43	51	49	44	46	39	45	32	42	519
Totals	Male	783	684	772	732	757	686	731	788	746	740	692	766	8,877
	Female	725	619	743	643	682	677	751	750	750	640	692	737	8,409
	Not stated	12	9	12	6	7	9	11	9	3	8	11	11	108
Grand Total		1520	1312	1527	1381	1446	1372	1493	1547	1499	1388	1395	1514	17,394

TABLE V.

EXHIBITING THE NUMBER OF DEATHS, BY SEXES, IN THE SEVERAL COUNTIES FOR EACH MONTH IN THE YEAR ENDING DECEMBER 31, 1890.

COUNTIES.	SEX.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Total.
	Male	216	112	117	106	108	99	129	103	107	105	106	103	1,411
Hartford	Female	189	109	98	120	118	89	112	132	92	95	92	89	1,335
	Not stated	----	----	----	----	----	----	----	----	----	----	----	----	------
		405	221	115	226	226	188	241	235	199	200	198	192	2,746
	Male	247	151	169	169	150	151	226	200	151	156	137	146	2,053
New Haven	Female	252	146	152	137	114	132	237	174	116	149	122	163	1,894
	Not stated	----	1	----	----	----	----	----	----	----	----	----	----	1
		599	298	321	306	264	283	463	374	367	305	259	309	3,948
	Male	95	39	67	72	59	50	76	84	57	64	42	48	753
New London	Female	91	56	60	50	50	40	56	66	66	60	48	48	691
	Not stated	----	----	----	----	----	--	----	----	---	----	----	----	------
		186	95	127	122	109	90	132	150	123	124	90	96	1,444
	Male	143	110	120	124	97	97	138	128	107	91	114	87	1,356
Fairfield	Female	159	107	96	110	85	82	111	125	110	87	90	106	1,268
	Not stated	----	----	----	----	----	----	1	----	----	----	----	1	2
		302	217	216	234	182	179	250	253	217	178	204	194	2,626
	Male	43	50	30	39	26	24	34	33	39	33	30	28	409
Windham	Female	38	34	39	36	34	35	30	51	33	34	37	33	434
	Not stated	----	----	----	----	----	----	----	----	----	----	----	----	------
		81	84	69	75	60	59	64	84	72	67	67	61	843
	Male	53	50	45	29	23	24	32	50	38	32	26	24	426
Litchfield	Female	53	51	30	24	31	29	38	45	30	25	35	42	433
	Not stated	----	----	----	----	1	----	1	----	----	----	1	----	3
		106	101	75	53	55	53	71	95	68	57	62	66	862
	Male	35	34	31	36	40	33	39	53	25	38	28	21	413
Middlesex	Female	39	30	26	28	37	25	43	49	26	45	23	20	391
	Not stated	----	----	----	----	----	----	----	1	----	----	----	----	1
		74	64	57	64	77	58	82	103	51	83	51	41	805
	Male	21	10	16	22	15	15	16	19	17	12	13	19	195
Tolland	Female	19	17	23	22	17	9	18	15	17	11	13	15	196
	Not stated	----	----	----	----	----	----	----	----	----	----	----	----	------
		40	27	39	44	32	24	34	34	34	23	26	34	391
	Male	853	556	595	597	518	493	690	670	541	531	496	476	7,016
Totals	Female	840	550	524	527	486	441	645	657	490	506	460	516	6,642
	Not stated	----	1	----	----	1	----	2	1	----	----	1	1	7
Grand Total		1693	1107	1119	1124	1005	934	1337	1328	1031	1037	957	993	13,665

TABLE VI

EXHIBITS THE NUMBER OF DEATHS IN EACH TOWN FROM THE DIFFERENT CAUSES, NOSOLOGICALLY ARRANGED BY CLASSES AND ORDERS. HARTFORD COUNTY.

CAUSES OF DEATH.	STATE.	Hartford.	Avon.	Berlin.	Bloomfield.	Bristol.	Burlington.	Canton.	East Granby.	East Hartford.	East Windsor.	Enfield.	Farmington.	Glastonbury.	Granby.	Hartland.	Manchester.	Marlborough.	New Britain.	Newington.	Plainville.	Rocky Hill.	Simsbury.	Southington.	South Windsor.	Suffield.	West Hartford.	Wethersfield.	Windsor.	Windsor Locks.	TOTAL.
CLASS I.—Zymotic Diseases.																															
ORDER 1. MIASMATIC.																															
Small Pox	12										1																			1	2
Chicken Pox	1																														
Measles	18																1													1	2
Scarlet Fever	67	4	1											1			2		3		1										12
Typhus Fever	3																														
Influenza	185	26	1		1			5				1	2				1	1	8		1					2		1		1	51
Typhoid Fever	312	30			1	5						3	1	3			2		15			1	1	2							64
Cerebro-Spinal Fever	22	1						1					1				1														4
Continued Fever	17	1																													1
Whooping Cough	137	13				8					3								3												27
Diphtheria	435	62	1	4	1	1				3		2		6			3		21					7			1	1	4		117
Membranous Croup	122	6				1				1		4		5			2		2					2							23
Mumps	1																														
Other Miasmatic Diseases	10					1																									1

ORDER 2. DIARRHŒAL.																															
Cholera Infantum	660	55	1		1	6	2	2	1	2	2	10					11		17	1			1	4		3	5	1		2	127
Infantile Diarrhœa	219									2							3		6					1	1					1	14
Cholera Morbus	29	5						1																1							7
Dysentery	98	3				2	1			1		1		2			2		3		1		2						1		19
Diarrhœa	84	12									1	1			1						1							1			17
ORDER 3. MALARIAL.																															
Intermittent Fever	7	1																	1												2
Remittent Fever	16	2		1																				1							4
Pernicious or Congestive Fever	9																														
Other Malarial Diseases	47	2								1		1					3														7
ORDER 4. ZOOGENOUS.																															
Hydrophobia	1																		1												1
ORDER 5. VENEREAL.																															
Syphilis	10	4																													4
Gonorrhœa, Stricture of Urethra	1																														
ORDER 6. SEPTIC.																															
Phagedena	1																														
Erysipelas	45	9				1								1			1		1					1							14
Pyæmia, Septicæmia	39	2					1				1								1				1								6
Puerperal Fever	50					2					1																		2		5
CLASS II.—Parasitic Diseases.																															
CLASS III.—Dietetic Diseases.																															
Starvation	2																		1												1
Intemperance	14							1		1							1								1						4
Chronic Alcoholism	56	22																						1							23
Delirium Tremens	2																														

TABLE VI.—CONTINUED. HARTFORD COUNTY.

CAUSES OF DEATH.	STATE.	Hartford.	Avon.	Berlin.	Bloomfield.	Bristol.	Burlington.	Canton.	East Granby.	East Hartford.	East Windsor.	Enfield.	Farmington.	Glastonbury.	Granby.	Hartland.	Manchester.	Marlborough.	New Britain.	Newington.	Plainville.	Rocky Hill.	Simsbury.	Southington.	South Windsor.	Suffield.	West Hartford.	Wethersfield.	Windsor.	Windsor Locks.	TOTAL.
CLASS IV.—Constitutional Diseases.																															
Rheumatism	109	13	1			1							1	1					1			2	1				1		1		23
Cancer of Breast	45	3										1					1						1								6
Cancer of Stomach	65	3						1									1		3				1						2		11
Cancer of Womb	38	7				1				1									2		1			1					1		14
Cancer of other organs	213	25	1		1	5				1	1	3		2		1	2		10			1		2	1	2	1		4	1	64
Tabes Mesenterica	63			1									2				2		1										1		7
Tubercular Meningitis, Acute Hydrocephalus	92	9				2						1					1		1												14
Phthisis	1544	116	1	5		27	2	9	2	7	3	20	1	7	1		14	2	25	1	1	2	6	10	1	7	3	11	7	6	297
Other forms of Tuberculosis	60														1		1			1	1						1			1	6
Scrofula	31	1				1																		1							3
Pott's Disease	2																														---
Hip-Joint Disease	5	1																													1
Purpura	10																1														1
Anæmia	31	2	1								1						1								1			1			7
Diabetes	62	2				1				1							2		1								1	1			9
Other Constitutional Diseases	5																														---

CLASS V.—Developmental Diseases.																															
Premature Birth	200	13				4			1	1							1		6			2			1	2				1	32
Atelectasis	11			1									1																		2
Cyanosis	20	8											1																		9
Spina Bifida	9																														
Imperforate Anus	1																														
Other Congenital Malformations	14												1	1					1												3
Umbilical Hemorrhage	4																			1											1
Old Age	638	61	1	2		4		1	1	6	2	11	4	4			2	1	11	1	1	1	1	4	1	8	1	2	5	1	137
CLASS VI.—Local Diseases.																															
ORDER 1. OF NERVOUS SYSTEM.																															
Inflammation of Brain or its Membranes	327	23	1		1	3	2	2		1			3	1			5		7				2	5	1	2			1	1	61
Apoplexy	542	40	1	2		1		1	1	2	2	3	4	3	3		3	1	9		3		2	3	3	3	1	5	3	1	100
Softening of Brain	91	13				1				1									1					1	2						19
Hydrocephalus, not acute	25																		1											1	2
Hemiplegia	31											1																	1		2
Paralysis Agitans	37											1		1		1															3
Insanity	76	10						1		1		1																			13
Chorea	4																														
Epilepsy	47	3						1				1							1												6
Convulsions	281	20	1	3		2	1			1		7		4			5	1	5					1	1	1			1	1	55
Trismus Nascentium	14																														
Tetanus	17	1																													1
Paraplegia	10					1											1											1			3
Diseases of Spinal Cord	16									1							1														2
Myelitis	10	4																													4
Spinal Meningitis	33	2			1	1						1		1																1	7
Locomotor Ataxia	7																														
Other Diseases of Nervous System	271	20		2	1	2	3	1				3							6				1	3		4	1		2		49

TABLE VI.—CONTINUED. HARTFORD COUNTY.

CAUSES OF DEATH.	STATE.	Hartford.	Avon.	Berlin.	Bloomfield.	Bristol.	Burlington.	Canton.	East Granby.	East Hartford.	East Windsor.	Enfield.	Farmington.	Glastonbury.	Granby.	Hartland.	Manchester.	Marlborough.	New Britain.	Newington.	Plainville.	Rocky Hill.	Simsbury.	Southington.	South Windsor.	Suffield.	West Hartford.	Wethersfield.	Windsor.	Windsor Locks.	TOTAL.
ORDER 2. OF ORGANS OF SPECIAL SENSE.																															
Otitis	3																														
Other Diseases of Eye, Ear or Nose	2	1																													1
ORDER 3. OF CIRCULATORY SYSTEM.																															
Endocarditis	55			1		1	1	1									1		1									1			7
Valvular Disease of Heart	177																		4		1			2						1	8
Disease of Heart	466	98			5	2	1			5	4						10		4		2		1	9	1		1		2	2	147
Pericarditis	30	1						3				1			2		1														8
Hypertrophy of Heart	70											1		1					1			3	2			4	1			3	16
Angina Pectoris	59						1						1																		2
Syncope	14																														
Aneurism	12	1																						1							2
Senile Gangrene	15							1																							1
Thrombosis, Embolism	63								1			7	5				2							1							16
Phlebitis	1																			1											1
Other Diseases of Circulatory System	126	4		1		1	1					11									1			2							21

Order 4. Of Respiratory System.																															
Laryngitis	17	2										1							1												4
Catarrhal Croup	1																														
Other Diseases of Larynx or Trachea	5																														
Emphysema, Asthma	27	4				1				1														1					1		8
Bronchitis	455	40		1	1	4	1			3		11		2		1	5		21		2	2		3	1				1	1	100
Pneumonia	1430	108	1	5	3	16	6	9	4	7	7	11	8	4	4	4	21	1	41	1	5	10	1	6	3	4	3	7	12	16	328
Pleurisy	31	2				1				1																					4
Other Diseases of Respiratory System	29	4																	2				1								7
Order 5. Of Digestive System.																															
Stomatitis	7	1																													1
Dentition	30																1									1					2
Quinsy	10																														
Dyspepsia	25				1												1									1					3
Hæmatemesis	5																														
Disease of Stomach	136	7						1		1		1					1		4		1										16
Ulcer of Stomach	22																		1					1							2
Enteritis	131	6				2						4			2			1	2		1				1	2			2		23
Ulceration of Intestines	9																														
Obstruction of Intestines	31	1									1								2					1							5
Strangulation of Intestines	5																														
Intussusception of Intestines	7			1																											1
Hernia	22																		1												1
Fistula	2																														
Peritonitis (not puerperal)	120	12			1	4	1										2		3						1					1	25
Ascites	11																														
Gallstones	4																														
Cirrhosis of Liver	46	6								3									1												10
Other Diseases of Liver	52	5				2		1	1	1				2	1		2							1				1			17
Hepatitis	34	2															1				1	1	1	1						1	8
Jaundice	17													1			1										1				3
Other Diseases of Digestive System	21																							1							1

TABLE VI.—CONTINUED. HARTFORD COUNTY.

CAUSES OF DEATH.	STATE.	Hartford.	Avon.	Berlin.	Bloomfield.	Bristol.	Burlington.	Canton.	East Granby.	East Hartford.	East Windsor.	Enfield.	Farmington.	Glastonbury.	Granby.	Hartland.	Manchester.	Marlborough.	New Britain.	Newington.	Plainville.	Rocky Hill.	Simsbury.	Southington.	South Windsor.	Suffield.	West Hartford.	Wethersfield.	Windsor.	Windsor Locks.	TOTAL.
ORDER 6. OF LYMPHATIC SYSTEM AND DUCTLESS GLANDS.																															
Bronchocele	1																														
ORDER 7. OF URINARY SYSTEM.																															
Nephritis	76	8													1				2			2									13
Bright's Disease	294	37	1	4		1		2		3	2			2			1	1	6	1	1		1	2		1	3		1	4	74
Uræmia	39	3			1	1	1																								6
Suppression of Urine	1																														
Calculus	4																														
Hæmaturia	12	2																				1									3
Disease of Bladder	55	4			1	1							1	1			2	1	1					1		1					14
Prostatitis	8																														
Other Diseases of Urinary System	18																		1												1

Order 8. Of Generative System.																															
A. Diseases of the Reproductive Organs.																															
Diseases of the Uterus	12	1															1														2
Metritis	2																														
Disease of Ovaries	12	1																													1
Pelvic Abscess	1																														
Perineal Abscess	1																														
B. Diseases of Parturition.																															
Abortion and Miscarriage	6												1															1			2
Puerperal Mania	5																					1									1
Puerperal Convulsions	10							1			1	1										1									4
Puerperal Hemorrhage	5																														
Placenta Previa	3					1																									1
Other Accidents of Childbirth	50	3						1		1							1	1	2							1	1			1	12
Order 9. Of Organs of Locomotion.																															
Caries, Necrosis	7																														
Arthritis, Periostitis	3	1						1																							2
Other Diseases of Organs of Locomotion	1																														
Order 10. Of Integumentary System.																															
Carbuncles	4																														
Other Diseases of Integumentary System	10																														

TABLE VI.—CONTINUED. HARTFORD COUNTY.

CAUSES OF DEATH.	STATE.	Hartford.	Avon.	Berlin.	Bloomfield.	Bristol.	Burlington.	Canton.	East Granby.	East Hartford.	East Windsor.	Enfield.	Farmington.	Glastonbury.	Granby.	Hartland.	Manchester.	Marlborough.	New Britain.	Newington.	Plainville.	Rocky Hill.	Simsbury.	Southington.	South Windsor.	Suffield.	West Hartford.	Wethersfield.	Windsor.	Windsor Locks.	TOTAL.
CLASS VII.—Violence.																															
ORDER 1. ACCIDENT OR NEGLIGENCE.																															
Fractures and Contusions	36	7														1					1			2				1			12
Fractures and Contusions of Skull	29	7																	2					1	1				1		12
Railroad Injuries	146	18		2				1		1							3		5	1	1	1	1			1				1	36
Gun-shot Wound	4	1																													1
Burns and Scalds	38	1									1			1																	3
Poisoned	15	1															1														2
Drowning	71	3	1				2	1			1		1						1												10
Suffocation	14	1																													1
Other Accidents	56	6		3		1	1							1			1						1							1	15
Falling	52					2											1													1	4
ORDER 2. HOMICIDE.																															
Murder	5	1								1																					2
Manslaughter	1																														

ORDER 3. SUICIDE.																															
Gun-shot Wounds	17	1				1												1													3
Cut, Stab	12	1					1										1							1							4
Poisoned	8																			1											1
By Opium	6													1																	1
Drowning	27			1		1													1												3
Hanging	16	2																	1					1							4
Otherwise	7	1																						1							2
CLASS VIII.—Unclassified.																															
Tumor	31	4					1					2			1		1												1		10
Dropsy	74	1										2		1			2									1					7
Debility, Atrophy, Inanition	318	43				4		1		3		2		5	1		4		6		1		1	4			3		2	3	83
Sunstroke	12			1															1										1		3
Exhaustion	41			1																							3		1		5
Hemorrhage	41	4									1						1														6
Abscess	23	4															1														5
Sudden Deaths	10													1																	1
Surgical Operation	4	1																												1	2
Other ill-defined causes	198	3	1			2	4	1				2		3			6		2	1	1		1						1		28
Cause not stated	33	2								1		3							3									2	1		12

RECAPITULATION OF HARTFORD COUNTY.

CLASSIFIED DISEASES.	STATE.	Hartford.	Avon.	Berlin.	Bloomfield.	Bristol.	Burlington.	Canton.	East Granby.	East Hartford.	East Windsor.	Enfield.	Farmington.	Glastonbury.	Granby.	Hartland.	Manchester.	Marlborough.	New Britain.	Newington.	Plainville.	Rocky Hill.	Simsbury.	Southington.	South Windsor.	Suffield.	West Hartford.	Wethersfield.	Windsor.	Windsor Locks.	TOTAL.
All causes	13665	1138	16	42	21	133	34	52	12	67	36	137	39	69	18	8	153	11	299	10	31	31	31	94	22	51	32	38	63	58	2746
CLASSES.																															
I. Zymotic Diseases	2658	238	4	5	4	27	4	9	1	10	9	23	4	18	1	..	32	1	82	1	4	1	5	19	1	5	6	4	7	6	531
II. Parasitic Diseases																															
III. Dietetic Diseases	74	22						1		1							1		1					1	1						28
IV. Constitutional Diseases	2375	182	4	6	1	38	2	10	2	10	5	25	4	10	2	1	26	2	44	2	3	5	9	14	3	9	7	13	16	8	463
V. Developmental Diseases	897	82	1	3	..	8	..	1	2	7	2	11	7	5	..	..	3	1	18	2	1	3	1	4	2	10	1	2	5	2	184
VI. Local Diseases	6316	501	5	20	16	49	19	27	7	33	17	67	23	23	13	6	59	7	131	3	18	21	12	46	14	25	12	16	27	35	1262
VII. Violence	560	51	1	6	..	5	4	2	..	2	2	...	1	3	..	1	7	..	11	1	3	1	2	6	1	1	..	1	1	3	116
VIII. Ill Defined and cause not stated	785	62	1	2	..	6	5	2	..	4	1	11	..	10	2	..	15	..	12	1	2	..	2	4	..	1	6	2	7	4	162
Class I. Orders.																															
1. Miasmatic Diseases	1342	143	3	4	3	16	..	6	..	4	4	10	4	15	..	..	12	1	52	..	2	1	1	11	..	2	1	2	4	3	304
2. Diarrhœal Diseases	1090	75	1	..	1	8	3	3	1	5	3	12	..	2	1	..	16	..	26	1	2	..	3	6	1	3	5	2	1	3	184
3. Malarial Diseases	79	5	..	1						1	..	1					3	..	1	..				1							13
4. Zoogenous Diseases	1																		1	..											1
5. Venereal Diseases	11	4																													4
6. Septic	135	11				3	1				2			1			1		2				1	1					2	..	25
Class II. Orders.																															
Parasitic Diseases																															

Class III. Orders.																															
Dietetic Diseases	74	22						1		1							1		1					1	1						28
Class IV. Orders.																															
Constitutional Diseases	2375	182	4	6	1	38	2	10	2	10	5	25	4	10	2	1	26	2	44	2	3	5	9	14	3	9	7	13	16	8	463
Class V. Orders.																															
Developmental Diseases	897	82	1	3		8		1	2	7	2	11	7	5			3	1	18	2	1	3	1	4	2	10	1	2	5	2	184
Class VI. Orders.																															
1. Diseases of Nervous System	1839	136	3	7	3	11	6	6	1	7	2	18	7	10	3	1	15	2	30		3		5	13	7	10	2	6	8	5	327
2. Organs of Special Sense	5	1																													1
3. Circulatory System	1088	104		2	5	4	4	5	1	5	4	20	6	1	2		14		10	1	4	3	3	15	1	4	2	1	2	6	229
4. Respiratory System	1995	160	1	6	4	22	7	9	4	12	7	23	8	6	4	5	26	1	65	1	7	12	2	10	4	4	3	7	14	17	451
5. Digestive System	749	40		1	2	8	1	2	1	5	1	5		3	3		9	1	14		3	1	1	5	2	4	1	1	2	2	118
6. Lymphatic Syst. and Ductless Glands	1																														
7. Urinary System	507	54	1	4	2	3	1	2		3	2		1	3	1		3	2	10	1	1	3	1	3		2	3		1	4	111
8. Generative System	107	5				1		2		1	1	1	1				2	1	2			2				1	1	1		1	23
9. Organs of Locomotion	11	1						1																							2
10. Integumentary System	14																														
Class VII. Orders.																															
1. Accident or Negligence	461	45	1	5		3	3	2		1	2		1	2		1	6		8	1	2	1	2	3	1	1		1	1	3	96
2. Homicide	6	1								1																					2
3. Suicide	93	5		1		2	1							1			1		3		1			3							18
Class VIII. Orders.																															
1. Ill Defined	752	60	1	2		6	5	2		3	1	8		10	2		15		9	1	2		2	4		1	6		6	4	150
2. Cause not stated	33	2								1		3							3									2	1		12

TABLE VI.—Continued.

NEW HAVEN COUNTY.

CAUSES OF DEATH.	STATE.	New Haven.	Ansonia.	Beacon Falls.	Bethany.	Branford.	Cheshire.	Derby.	East Haven.	Guilford.	Hamden.	Madison.	Meriden.	Middlebury.	Milford.	Naugatuck.	North Branford.	North Haven.	Orange.	Oxford.	Prospect.	Seymour.	Southbury.	Wallingford.	Waterbury.	Wolcott.	Woodbridge.	TOTAL.
CLASS I.—Zymotic Diseases.																												
ORDER 1. MIASMATIC.																												
Small Pox	12												10															10
Chicken Pox	1																											
Measles	18																			2								2
Scarlet Fever	67	7	4								1		1			3									1			17
Typhus Fever	3																											
Influenza	185	3	3				1	1		3	1		3					1	5		1	3			5		1	31
Typhoid Fever	312	24	1			4	2	4					13		1	4			1			3	1	2	43			103
Cerebro-Spinal Fever	22	5											2												1			8
Continued Fever	17	5											4		1					1					1			12
Whooping Cough	137	24	5		1			3		1			2					1	1			2		9	4			53
Diphtheria	435	83	23			4	1	2			1		21	3	2				1		1	3			16			161
Membranous Croup	122	22	2			1		1			2		8						1			1		2	9			49
Mumps	1																								1			1
Other Miasmatic Diseases	10					1																		1				2

ORDER 2. DIARRHŒAL.																												
Cholera Infantum	660	70	20			8		15	1	2	2		22	1	2	9		2	4	1				5	52		1	217
Infantile Diarrhœa	219	63						1		1	1		8		1			1	1			2		2	7			88
Cholera Morbus	29	6	1										1												3			11
Dysentery	98	6	2					4		1			3		1				1					1	3	1		23
Diarrhœa	84	7						1				1	1								1				18			29
ORDER 3. MALARIAL.																												
Intermittent Fever	7															1												1
Remittent Fever	16												1											1	1			3
Pernicious or Congestive Fever	9								1				1											1				3
Other Malarial Diseases	47	12					1	1			1		2					2	1			1						21
ORDER 4. ZOOGENOUS.																												
Hydrophobia	1																											
ORDER 5. VENEREAL.																												
Syphilis	10	1											1		1													3
Gonorrhœa, Stricture of Urethra	1																											
ORDER 6. SEPTIC.																												
Phagedena	1								1																			1
Erysipelas	45	12											2	1								1			1			17
Pyæmia, Septicæmia	39	1	1					1			1					1								1				6
Puerperal Fever	50	16						1					2						1									20
CLASS II.—Parasitic Diseases.																												
CLASS III.—Dietetic Diseases.																												
Starvation	2																		1									1
Intemperance	14				1																	1			2			4
Chronic Alcoholism	56	7										1	1			1									2			12
Delirium Tremens	2																											

TABLE VI.—CONTINUED. NEW HAVEN COUNTY.

CAUSES OF DEATH.	STATE.	New Haven.	Ansonia.	Beacon Falls.	Bethany.	Branford.	Cheshire.	Derby.	East Haven.	Guilford.	Hamden.	Madison.	Meriden.	Middlebury.	Milford.	Naugatuck.	North Branford.	North Haven.	Orange.	Oxford.	Prospect.	Seymour.	Southbury.	Wallingford.	Waterbury.	Wolcott.	Woodbridge.	TOTAL.
CLASS IV.—Constitutional Diseases.																												
Rheumatism	109	20					1	3	1	2									1					1	7			36
Cancer of Breast	45	7	1			1										1									1			11
Cancer of Stomach	65	13	3		1	1			1	1	1		2		1				1					1	2			28
Cancer of Womb	38	5											2												3			10
Cancer of other organs	213	16	1					1			1		6		2	1			1			1			8			38
Tabes Mesenterica	63	1	1					2											3			1			8			16
Tubercular Meningitis, Acute Hydrocephalus	92	4	2			1		1				1	6			6			2	1		1		1	7			33
Phthisis	1544	245	25		2	8	5	5	1	2	3	2	57	3	10	18	2	1	7	1	1	9	3	8	67		3	488
Other forms of Tuberculosis	60	2	1								2		4			3		1					1	2				16
Scrofula	31	2	1										1		1													5
Pott's Disease	2																								1			1
Hip-Joint Disease	5					1																						1
Purpura	10	2	1										1															4
Anæmia	31	7											1				1								2			11
Diabetes	62	11	1												2							1			1			16
Other Constitutional Diseases	5					3																						3

CLASS V.—Developmental Diseases.

Premature Birth	200	34	4			4		2			1		10					2						2	10	1		70
Atelectasis	11	2											2															4
Cyanosis	20	2				1																		1				4
Spina Bifida	9	4											1															5
Imperforate Anus	1																											
Other Congenital Malformations	14	1																										1
Umbilical Hemorrhage	4	1																										1
Old Age	638	55	10			4	5	2	1	4	4	8	9		6	3	1	3	2		3	2	4	3	14	1	1	145

CLASS VI.—Local Diseases.

ORDER 1. OF NERVOUS SYSTEM.

Inflammation of Brain or its Membranes	327	58	11			3		5		3	2		9	1	1			1	3			3	1	2	12		2	117
Apoplexy	542	61	3		1	3	3	3	1	1			17	4	4	8			3	1	2	1	6	4	25		1	152
Softening of Brain	91	11	1					1					2					2							1			18
Hydrocephalus, not acute	25	1	1												1										3			6
Hemiplegia	31	5				1						1																7
Paralysis Agitans	37											2																2
Insanity	76	4											2												1			7
Chorea	4	1																	1									2
Epilepsy	47	8	1							1			1												1			12
Convulsions	281	33	5			2	1	5		2	3		8			4			1			4		4	22			94
Trismus Nascentium	14	10	1						1																		1	13
Tetanus	17	5																						1				6
Paraplegia	10	1											2										1					4
Diseases of Spinal Cord	16																	1										1
Myelitis	10	2	1																									3
Spinal Meningitis	33					1			1				1															3
Locomotor Ataxia	7																			1			1					2
Other Diseases of Nervous System	271	36	3					1		5	1		6		3							3			7			65

TABLE VI.—CONTINUED. NEW HAVEN COUNTY.

CAUSES OF DEATH.	STATE.	New Haven.	Ansonia.	Beacon Falls.	Bethany.	Branford.	Cheshire.	Derby.	East Haven.	Guilford.	Hamden.	Madison.	Meriden.	Middlebury.	Milford.	Naugatuck.	North Branford.	North Haven.	Orange.	Oxford.	Prospect.	Seymour.	Southbury.	Wallingford.	Waterbury.	Wolcott.	Woodbridge.	TOTAL.
ORDER 2. OF ORGANS OF SPECIAL SENSE.																												
Otitis	3												1															1
Other Diseases of Eye, Ear or Nose	2																											
ORDER 3. OF CIRCULATORY SYSTEM.																												
Endocarditis	55	8	2										1							1			1		2			15
Valvular Disease of Heart	177	38	3			3	1				2		6							1		1			7			62
Disease of Heart	466	48	3			2	3	6		5	3	1	3		1	3		1	1					4	17			101
Pericarditis	30		1			1									1													3
Hypertrophy of Heart	70	3	2						1										1						2			9
Angina Pectoris	59	7				1																		1	1			10
Syncope	14																											
Aneurism	12		2																									2
Senile Gangrene	15																								2			2
Thrombosis, Embolism	63							2		1									1									4
Phlebitis	1																											
Other Diseases of Circulatory System	126	1	4	1			1								1				2					1			1	12

ORDER 4. OF RESPIRATORY SYSTEM.																												
Laryngitis	17	1						1					2															4
Catarrhal Croup	1																											
Other Diseases of Larynx or Trachea	5																											
Emphysema, Asthma	27		1					1											1							1		4
Bronchitis	455	77	10			1		4	1		3		14		3	1			5	1	2			4	27	1	2	156
Pneumonia	1430	221	16		1	8	3	6		9	16		46	2	3	23	2	5	10	2	1	2	2	14	65		1	458
Pleurisy	31	3	2					1			1					1									2			10
Other Diseases of Respiratory System	29	2									1		1			1		1							3			9
ORDER 5. OF DIGESTIVE SYSTEM.																												
Stomatitis	7	1																							2			3
Dentition	30	2											5			1			1						2			11
Quinsy	10		1																									1
Dyspepsia	25	2						2																	1			5
Hæmatemesis	5																											
Disease of Stomach	136	21	8							2	1	1	1			1						1			2			38
Ulcer of Stomach	22	1	1			1							1						1					1	1			7
Enteritis	131	12	9					1		2	1		3	1								1	1	1	8			40
Ulceration of Intestines	9	2									2																	4
Obstruction of Intestines	31	3														1			1						3			8
Strangulation of Intestines	5										1								1					1				3
Intussusception of Intestines	7	3	1																									4
Hernia	22	3														1		1	1	1		1		1	2			11
Fistula	2	1																										1
Peritonitis (not puerperal)	120	13	1			2							1		3	2						1		1	7			31
Ascites	11	4																							1			5
Gallstones	4																											
Cirrhosis of Liver	48	5				1		1			1		1			1									2			12
Other Diseases of Liver	52		1			1	1	1								1								1				6
Hepatitis	34	8										1	2									1						12
Jaundice	17	1																							1			2
Other Diseases of Digestive System	21	2	1			1	1																		1			6

TABLE VI.—CONTINUED. NEW HAVEN COUNTY.

CAUSES OF DEATH.	STATE.	New Haven.	Ansonia.	Beacon Falls.	Bethany.	Branford.	Cheshire.	Derby.	East Haven.	Guilford.	Hamden.	Madison.	Meriden.	Middlebury.	Milford.	Naugatuck.	North Branford.	North Haven.	Orange.	Oxford.	Prospect.	Seymour.	Southbury.	Wallingford.	Waterbury.	Wolcott.	Woodbridge.	TOTAL.
ORDER 6. OF LYMPHATIC SYSTEM AND DUCTLESS GLANDS.																												
Bronchocele	1																											
ORDER 7. OF URINARY SYSTEM.																												
Nephritis	76	12	2					1			1		5						1						8			30
Bright's Disease	294	24	1		1	1		2		2	1	1	7			1		1	1					5	8		1	57
Uræmia	39	4				1							1			1									3			10
Suppression of Urine	1																								1			1
Calculus	4	2																										2
Hæmaturia	12												1				1											2
Disease of Bladder	55	6					1						1						1			1		2	2			14
Prostatitis	8	1																		1								2
Other Diseases of Urinary System	18	2											1															3

ORDER 8. OF GENERATIVE SYSTEM.																												
A. *Diseases of the Reproductive Organs.*																												
Diseases of the Uterus	12	1							1																			2
Metritis	2	2																										2
Disease of Ovaries	12	5																						1				6
Pelvic Abscess	1																											
Perineal Abscess	1																											
B. *Diseases of Parturition.*																												
Abortion and Miscarriage	6		1																									1
Puerperal Mania	5																											
Puerperal Convulsions	10	2						1																				3
Puerperal Hemorrhage	5	1																										1
Placenta Previa	3	2																										2
Other Accidents of Childbirth	50	7				1										2						1			1			12
ORDER 9. OF ORGANS OF LOCOMOTION.																												
Caries, Necrosis	7	2																										2
Arthritis, Periostitis	3		1																									1
Other Diseases of Organs of Locomotion	1																											
ORDER 10. OF INTEGUMENTARY SYSTEM.																												
Carbuncles	4																									1		1
Other Diseases of Integumentary System	10	4																1										5

TABLE VI.—CONTINUED. NEW HAVEN COUNTY.

CAUSES OF DEATH.	STATE.	New Haven.	Ansonia.	Beacon Falls.	Bethany.	Branford.	Cheshire.	Derby.	East Haven.	Guilford.	Hamden.	Madison.	Meriden.	Middlebury.	Milford.	Naugatuck.	North Branford.	North Haven.	Orange.	Oxford.	Prospect.	Seymour.	Southbury.	Wallingford.	Waterbury.	Wolcott.	Woodbridge.	TOTAL.
CLASS VII.—Violence.																												
ORDER 1. ACCIDENT OR NEGLIGENCE.																												
Fractures and Contusions	36	5									1		2															8
Fractures and Contusions of Skull	29	1																							4			5
Railroad Injuries	146	25	2			2		2				2	5		2			1						1	6			48
Gun-shot Wound	4	1																										1
Burns and Scalds	38	5	1					1				1	4			1								1	1			15
Poisoned	15	1	1			1							1			1						1			2			8
Drowning	71	6	1			1					1	2							3					2	2	1		19
Suffocation	14	5											1			1									2			9
Other Accidents	56	3	1		1			1		1	1		1	1		1			1						2			14
Falling	52	12	3								1				1										2			19
ORDER 2. HOMICIDE.																												
Murder	5																								1			1
Manslaughter	1																											

ORDER 3. SUICIDE.																												
Gun-shot Wounds	17	4											1												1			6
Cut, Stab	12		1																									1
Poisoned	8	2																							2			4
By Opium	6	2											1												1			4
Drowning	27										1		2	3	3	1									1			11
Hanging	16	2	1																									3
Otherwise	7					1									1										2			4
CLASS VIII.—Unclassified.																												
Tumor	31	4											2												2			8
Dropsy	74	1										1	2			1	1		1						3	1	1	12
Debility, Atrophy, Inanition	318	43	1					4		1	4		5			4				2					20			84
Sunstroke	12	1							1					1										1				4
Exhaustion	41	1								1		3	3											3	1			12
Hemorrhage	41		1								1					1									3			6
Abscess	23	1						1					2												2			6
Sudden Death	10																							1				1
Surgical Operation	4																											
Other ill-defined causes	198	4	4					2		1	2		3		1	2						3	1	1	6			30
Cause not stated	33															1									3			4

RECAPITULATION OF NEW HAVEN COUNTY.

CLASSIFIED DISEASES.	STATE.	New Haven.	Ansonia.	Beacon Falls.	Bethany.	Branford.	Cheshire.	Derby.	East Haven.	Guilford.	Hamden.	Madison.	Meriden.	Middlebury.	Milford.	Naugatuck.	North Branford.	North Haven.	Orange.	Oxford.	Prospect.	Seymour.	Southbury.	Wallingford.	Waterbury.	Wolcott.	Woodbridge.	TOTAL.
All causes	13665	1743	231	1	9	82	31	107	14	54	74	29	398	21	60	118	9	28	77	17	12	57	23	103	626	8	16	3948
CLASSES.																												
I. Zymotic Diseases	2658	367	62		1	18	5	35	3	8	10	1	108	5	9	18		7	17	4	3	16	1	25	166	1	2	892
II. Parasitic Diseases																												
III. Dietetic Diseases	74	7			1							1	1			1			1			1			4			17
IV. Constitutional Diseases	2375	335	37		3	15	6	12	3	5	7	3	80	3	16	29	3	2	15	2	1	13	4	13	107		3	717
V. Developmental Diseases	897	99	14			9	5	4	1	4	5	8	22		6	3	1	5	2		3	2	4	6	24	2	1	230
VI. Local Diseases	6316	806	101	1	3	35	15	45	6	33	40	7	152	8	21	53	4	13	37	9	5	21	13	49	256	3	9	145
VII. Violence	560	74	11		1	5		4		1	5	5	18	4	7	5		1	4			1		4	29	1		180
VIII. Ill Defined and cause not stated	785	55	6					7	1	3	7	4	17	1	1	9	1		1	2		3	1	6	40	1	1	167
Class I. Orders.																												
1. Miasmatic Diseases	1342	173	38		1	10	4	11		4	5		64	3	4	7		2	9	3	2	12	1	14	81		1	449
2. Diarrhœal Diseases	1090	152	23			8		21	1	4	3	1	35	1	4	9		3	6	1	1	2		8	83	1	1	368
3. Malarial Diseases	79	12					1	1	1		1		4			1		2	1			1		2	1			28
4. Zoogenous Diseases	1																											
5. Venereal Diseases	11	1											1		1													3
6. Septic	135	29	1					2	1		1		4	1		1			1			1		1	1			44
Class II. Orders.																												
Parasitic Diseases																												

Class III. Orders.																												
Dietetic Diseases	74	7			1							1	1			1			1			1			4			17
Class IV. Orders.																												
D Constitutional Diseases	2375	335	37		3	15	6	12	3	5	7	3	80	3	16	29	3	2	15	2	1	13	4	13	107		3	717
Class V. Orders.																												
Developmental Diseases	897	99	14			9	5	4	1	4	5	8	22		6	3	1	5	2		3	2	4	6	24	2	1	230
Class VI. Orders.																												
1. Diseases of Nervous System	1839	236	27		1	10	4	15	3	12	6	3	48	5	9	12		4	8	2	2	11	9	11	72		4	514
2. Organs of Special Sense	5												1															1
3. Circulatory System	1088	105	17	1		7	5	8	1	6	5	1	10		3	3		1	5	2		1	1	6	31		1	220
4. Respiratory System	1995	304	29		1	9	3	13	1	9	21		63	2	6	26	2	6	16	3	3	2	2	18	97	2	3	641
5. Digestive System	749	84	23			6	2	5		4	6	2	14	1	3	8		1	5	1		5	1	6	33			210
6. Lymphatic Syst. and Ductless Glands	1																											
7. Urinary System	507	51	3		1	2	1	3		2	2	1	16			2	1	1	3	1		1		7	22		1	121
8. Generative System	107	20	1			1		1	1							2						1		1	1			29
9. Organs of Locomotion	11	2	1																									3
10. Integumentary System	14	4															1									1		6
Class VII. Orders.																												
1. Accident or Negligence	461	64	9		1	4		4		1	4	5	14	1	3	4		1	4			1		4	21	1		146
2. Homicide	6																								1			1
3. Suicide	93	10	2			1					1		4	3	4	1									7			33
Class VIII. Orders.																												
1. Ill Defined	752	55	6					7	1	3	7	4	17	1	1	8	1		1	2		3	1	6	37	1	1	163
2. Cause not stated	33															1									3			4

TABLE VI.—Continued.

New London County.

CAUSES OF DEATH.	State.	New London.	Bozrah.	Colchester.	East Lyme.	Franklin.	Griswold.	Groton.	Lebanon.	Ledyard.	Lisbon.	Lyme.	Montville.	Norwich.	No. Stonington.	Old Lyme.	Preston.	Salem.	Sprague.	Stonington.	Voluntown.	Waterford.	Total.
CLASS I.—Zymotic Diseases.																							
Order 1. Miasmatic.																							
Small Pox	12																						
Chicken Pox	1																						
Measles	18			1	1							1								1			4
Scarlet Fever	67							1												3			4
Tpyhus Fever	3																						
Influenza	185	2		4			3	6	1				1	9				1		1			28
Typhoid Fever	312	7		2						2			1	5	1					2		4	24
Cerebro-Spinal Fever	22													1			1					1	3
Continued Fever	17																						
Whooping Cough	137	2						2						2									6
Diphtheria	435	5					3							25					4	2	1		40
Membranous Croup	122	1					2							4		1							8
Mumps	1																						
Other Miasmatic Diseases	10															1							1

ORDER 2. DIARRHŒAL.																							
Cholera Infantum	660	7		1	2		3	4			1			26	1	1				5	4	1	56
Infantile Diarrhœa	219	5		2	2		3	4						13						1		1	31
Cholera Morbus	29													2									2
Dysentery	98	8	1					2		1				2									14
Diarrhœa	84	3						2					1	3				1				1	11
ORDER 3. MALARIAL.																							
Intermittent Fever	7												1										1
Remittent Fever	16																				1		1
Pernicious or Congestive Fever	9														1							1	3
Other Malarial Diseases	47			1											1							1	3
ORDER 4. ZOOGENOUS.																							
Hydrophobia	1																						
ORDER 5. VENEREAL.																							
Syphilis	10													1									1
Gonorrhœa, Stricture of Uretha	1																						
ORDER 6. SEPTIC.																							
Phagedena	1																						
Erysipelas	45						1	1															2
Pyæmia, Septicæmia	39	1						2						1		1						1	6
Puerperal Fever	50																1						1
CLASS II.—Parasitic Diseases.																							
CLASS III.—Dietetic Diseases.																							
Starvation	2																						
Intemperance	14																						
Chronic Alcoholism	56						1	1						2									4
Delirium Tremens	2																						

TABLE VI.—CONTINUED. NEW LONDON COUNTY.

CAUSES OF DEATH.	STATE.	New London.	Bozrah.	Colchester.	East Lyme.	Franklin.	Griswold.	Groton.	Lebanon.	Ledyard.	Lisbon.	Lyme.	Montville.	Norwich.	No. Stonington.	Old Lyme.	Preston.	Salem.	Sprague.	Stonington.	Voluntown.	Waterford.	TOTAL.
CLASS IV.—Constitutional Diseases.																							
Rheumatism	109	2		2	2								2	3	1								12
Cancer of Breast	45	3						1					1	1								1	7
Cancer of Stomach	65	1		1					1					2									5
Cancer of Womb	38	2																					2
Cancer of other organs	213	3			1		1	2	2	1			1	7	2	1	2			3	2		28
Tabes Mesenterica	63	1		1			1							4								1	8
Tubercular Meningitis, Acute Hydrocephalus	92	1					2					1		6			1			2			13
Phthisis	1544	29		8	3		7	2		4			8	65	3	1	5	2	5	22	2	2	168
Other forms of Tuberculosis	60	1								1				3								1	6
Scrofula	31						3																3
Pott's Disease	2													1									1
Hip-Joint Disease	5																						
Purpura	10																						
Anæmia	31				1												1		1				3
Diabetes	62	1							1											1			3
Other Constitutional Diseases	5																						

CLASS V.—Developmental Diseases.																							
Premature Birth	200						1	4			1			10			2		1	2			21
Atelectasis	11																						
Cyanosis	20													1						1			2
Spina Bifida	9	1																					1
Imperforate Anus	1																						
Other Congenital Malformations	14										1									1			2
Umbilical Hemorrhage	4																						
Old Age	638	16	2	4			4	12			1	2	6	23	5	1	2	1		5	2	4	90
CLASS VI.—Local Diseases.																							
ORDER 1. OF NERVOUS SYSTEM.																							
Inflammation of Brain or its Membranes	327	3		1	1			3	1		1		2	12			1			6		1	32
Apoplexy	542	5	1	3		1		6	2	1	1	1	4	11	3	3	1	1		1		1	46
Softening of Brain	91			2		1			1					2	1					4	1		12
Hydrocephalus, not acute	25								1				1	3									5
Hemiplegia	31	3	1											3									7
Paralysis Agitans	37						1	2			1									2	1	1	9
Insanity	76		1		1		1							3						1		1	8
Chorea	4																						
Epilepsy	47			2								1										1	4
Convulsions	281	8		1			1	1						9		2				3		1	26
Trismus Nascentium	14																			1			1
Tetanus	17	1												1									2
Paraplegia	10																		1				1
Diseases of Spinal Cord	16											1		1	1								3
Myelitis	10													1									1
Spinal Meningitis	33						2			1									1	2			6
Locomotor Ataxia	7	1																					1
Other Diseases of Nervous System	271	11			1		2		3			1	3	11	1		2	1		3	1		40

TABLE VI.—CONTINUED. NEW LONDON COUNTY.

CAUSES OF DEATH.	STATE.	New London.	Bozrah.	Colchester.	East Lyme.	Franklin.	Griswold.	Groton.	Lebanon.	Ledyard.	Lisbon.	Lyme.	Montville.	Norwich.	No. Stonington.	Old Lyme.	Preston.	Salem.	Sprague.	Stonington.	Voluntown.	Waterford.	TOTAL.
ORDER 2. OF ORGANS OF SPECIAL SENSE.																							
Otitis	3																						
Other Diseases of Eye, Ear or Nose	2																						
ORDER 3. OF CIRCULATORY SYSTEM.																							
Endocarditis	55													2			1			1			4
Valvular Disease of Heart	177					1			1				3	8					1	1		4	19
Disease of Heart	466	3	1	3	1		4		1					21		1		1		7			43
Pericarditis	30													1									1
Hypertrophy of Heart	70		2					7			1										2		12
Angina Pectoris	59	20					1						1	3		1							26
Syncope	14	2						4													1		7
Aneurism	12													2						1			3
Senile Gangrene	15			1						1				1		1							4
Thrombosis, Embolism	63					1						4		1	1		1						8
Phlebitis	1																						
Other Diseases of Circulatory System	126								1							2				1			4

ORDER 4. OF RESPIRATORY SYSTEM.																							
Laryngitis	17																						
Catarrhal Croup	1																		1				1
Other Diseases of Larynx or Trachea	5																						
Emphysema, Asthma	27		1					1						1						1			4
Bronchitis	455	9	2		1			3		1	1	2		9			1			4		1	34
Pneumonia	1430	23	2	7	9	2	5	10	3	1	2		5	28	2		3			12	2	3	119
Pleurisy	31			1										1					1				3
Other Diseases of Respiratory System	29				1						1												2
ORDER 5. OF DIGESTIVE SYSTEM.																							
Stomatitis	7																		1				1
Dentition	30	3					1							1									5
Quinsy	10	1																					1
Dyspepsia	25	3												3							1		7
Hæmatemesis	5																						
Disease of Stomach	136	1			1		2	2						3						3			12
Ulcer of Stomach	22	1												1									2
Enteritis	131	2					3	1	1				3	6		1	2			4		2	25
Ulceration of Intestines	9																						
Obstruction of Intestines	31												1								1		2
Strangulation of Intestines	5																	1					1
Intussusception of Intestines	7																1						1
Hernia	22													1									1
Fistula	2																						
Peritonitis (not puerperal)	120	1			1						1		1	4	1					3			12
Ascites	11				1									1									2
Gallstones	4			1																			1
Cirrhosis of Liver	48	1						2		1				1					1				6
Other Diseases of Liver	52						1							5					1	2			9
Hepatitis	34	1																					1
Jaundice	17	4					1																5
Other Diseases of Digestive System	21																						

TABLE VI.—CONTINUED. WINDHAM COUNTY.

CAUSES OF DEATH.	STATE.	Brooklyn.	Ashford.	Canterbury.	Chaplin.	Eastford.	Hampton.	Killingly.	Plainfield.	Pomfret.	Putnam.	Scotland.	Sterling.	Thompson.	Windham.	Woodstock.	TOTAL.
ORDER 6. OF LYMPHATIC SYSTEM AND DUCTLESS GLANDS.																	
Bronchocele	1																
ORDER 7. OF URINARY SYSTEM.																	
Nephritis	76																
Bright's Disease	294		1			1		6	4				1	2	6		21
Uræmia	39	1							1								2
Suppression of Urine	1																
Calculus	4																
Hæmaturia	12																
Disease of Bladder	55									1	2						3
Prostatitis	8																
Other Diseases of Urinary System	18								1								1

ORDER 8. OF GENERATIVE SYSTEM.																							
A. *Diseases of the Reproductive Organs.*																							
Diseases of the Uterus	12																			1			1
Metritis	2																						
Diseases of Ovaries	12																						
Pelvic Abscess	1																						
Perineal Abscess	1																						
B. *Diseases of Parturition.*																							
Abortion and Miscarriage	6																						
Puerperal Mania	5																						
Puerperal Convulsions	10								1														1
Puerperal Hemorrhage	5																						
Placenta Previa	3																						
Other Accidents of Childbirth	50						1	1				1		1									4
ORDER 9. OF ORGANS OF LOCOMOTION.																							
Caries, Necrosis	7																						
Arthritis, Periostitis	3																						
Other Diseases of Organs of Locomotion	1																						
ORDER 10. OF INTEGUMENTARY SYSTEM.																							
Carbuncles	4	2																					2
Other Diseases of Integumentary System	10													1									1

TABLE VI.—CONTINUED. WINDHAM COUNTY.

CAUSES OF DEATH.	STATE.	Brooklyn.	Ashford.	Canterbury.	Chaplin.	Eastford.	Hampton.	Killingly.	Plainfield.	Pomfret.	Putnam.	Scotland.	Sterling.	Thompson.	Windham.	Woodstock.	TOTAL.
CLASS VII.—Violence.																	
ORDER 1. ACCIDENT OR NEGLIGENCE.																	
Fractures and Contusions	36																
Fractures and Contusions of Skull	29													1	3		4
Railroad Injuries	146										3			2	2		7
Gun-shot Wound	4																
Burns and Scalds	38																
Poisoned	15																
Drowning	71								1						2		3
Suffocation	14			1													1
Other Accidents	56	1								1						2	4
Falling	52										1						1
ORDER 2. HOMICIDE.																	
Murder	5																
Manslaughter	1																

ORDER 3. SUICIDE.																	
Gun-shot Wounds	17							2									2
Cut, Stab	12			1													1
Poisoned	8																
By Opium	6																
Drowning	27																
Hanging	16															1	1
Otherwise	7																
CLASS VIII.—Unclassified.																	
Tumor	31																
Dropsy	74	1		1		1			1			1	1		1	1	8
Debility, Atrophy, Inanition	318	2									2				1		5
Sunstroke	12																
Exhaustion	41	1						2									3
Hemorrhage	41									1	1					2	4
Abscess	23	1												1	1	1	4
Sudden Death	10																
Surgical Operation	4																
Other ill-defined causes	198	6							7	1	7		1	4	6		32
Cause not stated	33										2				1		3

RECAPITULATION OF WINDHAM COUNTY.

CLASSIFIED DISEASES.	STATE.	Brooklyn.	Ashford.	Canterbury.	Chaplin.	Eastford.	Hampton.	Killingly.	Plainfield.	Pomfret.	Putnam.	Scotland.	Sterling.	Thompson.	Windham.	Woodstock.	TOTAL.
All causes	13665	47	15	24	9	11	9	146	85	32	113	8	25	86	181	52	843
CLASSES.																	
I. Zymotic Diseases	2658	8	2	3	1	4	1	33	13	3	24	2	8	21	45	4	172
II. Parasitic Diseases																	
III. Dietetic Diseases	74							1							1		2
IV. Constitutional Diseases	2375	5		3		2	1	22	17	4	27	1	1	16	31	8	138
V. Developmental Diseases	897	1	4	1	2			24	1	4	10		1	1	10	9	68
VI. Local Diseases	6316	21	9	14	6	4	7	62	45	18	36	4	13	40	77	24	380
VII. Violence	560	1		2				2	1	1	4			3	7	3	24
VIII. Ill Defined and cause not stated	785	11		1		1		2	8	2	12	1	2	5	10	4	59
Class I. Orders.																	
1. Miasmatic Diseases	1342	3	1	1	1	2	1	18	6	2	9	2	5	4	19	1	75
2. Diarrhœal Diseases	1090	5	1	2		2		14	6	1	11		2	16	19	2	81
3. Malarial Diseases	79													1	4		5
4. Zoogenous Diseases	1																
5. Venereal Diseases	11																
6. Septic	135							1	1		4		1		3	1	11
Class II. Orders.																	
Parasitic Diseases																	

Class III. Orders.																	
Dietetic Diseases	74	....	....	....	....	....	....	1	....	....	....	....	....	....	1	....	2
Class IV. Orders.																	
Constitutional Diseases	2375	5	....	3	....	2	1	22	17	4	27	1	1	16	31	8	138
Class V. Orders.																	
Developmental Diseases	897	1	4	1	2	....	....	24	1	4	10	....	1	1	10	9	68
Class VI. Orders.																	
1. Diseases of Nervous System	1839	6	1	2	1	....	2	19	17	7	9	1	4	6	21	9	105
2. Organs of Special Sense	5	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
3. Circulatory System	1088	....	3	4	2	....	....	17	6	6	9	1	3	16	9	7	83
4. Respiratory System	1995	11	3	4	1	2	4	13	10	3	11	....	3	9	25	6	105
5. Digestive System	749	1	1	2	2	1	1	6	5	1	4	1	2	3	15	2	47
6. Lymphatic Syst. and Ductless Glands	1	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
7. Urinary System	507	1	1	....	....	1	....	6	6	1	2	....	1	2	6	....	27
8. Generative System	107	2	....	2	....	....	....	....	1	....	1	1	....	2	1	....	10
9. Organs of Locomotion	11	....	....	....	....	....	....	....	....	....	....	....	....	1	....	....	1
10. Integumentary System	14	....	....	....	....	....	....	1	....	....	....	....	....	1	....	....	2
Class VII. Orders.																	
1. Accident or Negligence	461	1	....	1	....	....	....	....	1	1	4	....	....	3	7	2	20
2. Homicide	6	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
3. Suicide	93	....	....	1	....	....	....	2	....	....	....	....	....	....	....	1	4
Class VIII. Orders.																	
1. Ill Defined	752	11	....	1	....	1	....	2	8	2	10	1	2	5	9	4	56
2. Cause not stated	33	....	....	....	....	....	....	....	....	....	2	....	....	....	1	....	3

TABLE VI.—Continued.

LITCHFIELD COUNTY.

CAUSES OF DEATH.	STATE.	Litchfield.	Barkhamsted.	Bethlehem.	Bridgewater.	Canaan.	Colebrook.	Cornwall.	Goshen.	Harwinton.	Kent.	Morris.	New Hartford.	New Milford.	Norfolk.	North Canaan.	Plymouth.	Roxbury.	Salisbury.	Sharon.	Thomaston.	Torrington.	Warren.	Washington.	Watertown.	Winchester.	Woodbury.	TOTAL.
CLASS I.—Zymotic Diseases.																												
ORDER 1. MIASMATIC.																												
Small Pox	12																											
Chicken Pox	1																											
Measles	18																											
Scarlet Fever	67																4					1			1			6
Typhus Fever	3																											
Influenza	185		1						3		1		2	2		1				1		4					2	17
Typhoid Fever	312						1		1				6	2		2		3				1		1	2		2	21
Cerebro-Spinal Fever	22	1																			2							3
Continued Fever	17																											
Whooping Cough	137															1		1		3				1			1	7
Diphtheria	435		1			2				1	1			1		1										7		14
Membranous Croup	122						2												1		1	1						5
Mumps	1																											
Other Miasmatic Diseases	10																											

ORDER 2. DIARRHŒAL.																												
Cholera Infantum	660							1	1	1		1		7	2		1		1		5	9			2	2		33
Infantile Diarrhœa	219												13			2	1				1	2		1				20
Cholera Morbus	29																											
Dysentery	98		1										6						2	1		1				4	1	16
Diarrhœa	84																		1					1	1			3
ORDER 3. MALARIAL.																												
Intermittent Fever	7																											
Remittent Fever	16																					1				1		2
Pernicious or Congestive Fever	9																											
Other Malarial Diseases	47	1																										1
ORDER 4. ZOOGENOUS.																												
Hydrophobia	1																											
ORDER 5. VENEREAL.																												
Syphilis	10																											
Gonorrhœa, Stricture of Urethra	1																											
ORDER 6. SEPTIC.																												
Phagedena	1																											
Erysipelas	45					1			1																			2
Pyæmia, Septicæmia	39																1					1						2
Puerperal Fever	50					1														2								3
CLASS II.—Parasitic Diseases.																												
CLASS III.—Dietetic Diseases.																												
Starvation	2																											
Intemperance	14																			1								1
Chronic Alcoholism	56																		1	1								2
Delirium Tremens	2																											

TABLE VI.—CONTINUED. LITCHFIELD COUNTY.

CAUSES OF DEATH.	STATE.	Litchfield.	Barkhamsted.	Bethlehem.	Bridgewater.	Canaan.	Colebrook.	Cornwall.	Goshen.	Harwinton.	Kent.	Morris.	New Hartford.	New Milford.	Norfolk.	North Canaan.	Plymouth.	Roxbury.	Salisbury.	Sharon.	Thomaston.	Torrington.	Warren.	Washington.	Watertown.	Winchester.	Woodbury.	TOTAL.
CLASS IV.—Constitutional Diseases.																												
Rheumatism	109										1		1								1	1	1			1	1	7
Cancer of Breast	45			2					1											1								4
Cancer of Stomach	65						1							1												1		3
Cancer of Womb	38																1											1
Cancer of other organs	213		1					1				1	2							1	1					1	2	10
Tabes Mesenterica	63	1												1							1		1				1	5
Tubercular Meningitis, Acute Hydrocephalus	92																2											2
Phthisis	1544	5				1		1	2		3	1	7	7	4	2	3	1	9	3	9	9		2	4	10	1	84
Other forms of Tuberculosis	60							1														2				1		4
Scrofula	31																		1					1		2		4
Pott's Disease	2																											
Hip-Joint Disease	5																									1		1
Purpura	10																								1			1
Anæmia	31																										1	1
Diabetes	62										1				1			1				1						4
Other Constitutional Diseases	5																											

CLASS V.—Developmental Diseases.																											
Premature Birth	200	1							1						2			2	1							2	2	11
Atelectasis	11																				1	2						3
Cyanosis	20																											
Spina Bifida	9																					1						1
Imperforate Anus	1																											
Other Congenital Malformations	14	1																										1
Umbilical Hemorrhage	4																											
Old Age	638	1	2		2	1	2	1	3	1	2		3	5	2	2	1	3	7	3		1			1	3	4	50
CLASS VI.—Local Diseases.																												
ORDER 1. OF NERVOUS SYSTEM.																												
Inflammation of Brain or its Membranes	327		1												3	1			3		1	3				1		13
Apoplexy	542	8	1	1		2	1		1	1			2	4	1			1		2	1	3	1	1	3	9	4	47
Softening of Brain	91		3										1	1												1	2	8
Hydrocephalus, not acute	25																						1	1				2
Hemiplegia	31												1															1
Paralysis Agitans	37			1					1			1			1													4
Insanity	76													1						1								2
Chorea	4																										1	1
Epilepsy	47							1						1					5									7
Convulsions	281	2	1	1										2	1							1				1		9
Trismus Nascentium	14																											
Tetanus	17																											
Paraplegia	10																											
Diseases of Spinal Cord	16																									2		2
Myelitis	10																											
Spinal Meningitis	33																		1					1				2
Locomotor Ataxia	7													1													1	2
Other Diseases of Nervous System	271					3		2		2			1	1		1	2			1	1	1		2	3	4		24

TABLE VI.—CONTINUED. LITCHFIELD COUNTY.

CAUSES OF DEATH.	STATE.	Litchfield.	Barkhamsted.	Bethlehem.	Bridgewater.	Canaan.	Colebrook.	Cornwall.	Goshen.	Harwinton.	Kent.	Morris.	New Hartford.	New Milford.	Norfolk.	North Canaan.	Plymouth.	Roxbury.	Salisbury.	Sharon.	Thomaston.	Torrington.	Warren.	Washington.	Watertown.	Winchester.	Woodbury.	TOTAL.
ORDER 2. OF ORGANS OF SPECIAL SENSE.																												
Otitis	3																											
Other Diseases of Eye, Ear or Nose	2																											
ORDER 3. OF CIRCULATORY SYSTEM.																												
Endocarditis	55																				1	1				2		4
Valvular Disease of Heart	177	2		1				1							1	1	3	2	2								1	14
Disease of Heart	466				3						1			2	1										1			8
Pericarditis	30									1			1								1			1		1		5
Hypertrophy of Heart	70		2				2	1											2	5		1				4	1	18
Angina Pectoris	59								1	1	1																	3
Syncope	14		1																									1
Aneurism	12							1																				1
Senile Gangrene	15																								1			1
Thrombosis, Embolism	63									1	1					2			3					5				12
Phlebitis	1																											
Other Diseases of Circulatory System	126	7	1											1					2			2			2			15

ORDER 4. OF RESPIRATORY SYSTEM.																											
Laryngitis	17						1										1										2
Catarrhal Croup	1																										
Other Diseases of Larynx or Trachea	5	1	1																								2
Emphysema, Asthma	27																										
Bronchitis	455	4	2			1							2	2		1			3	2		1		1	1	1		21
Pneumonia	1430		4	1	2	2		1			3		13	3	2	1	6	7	11	3	6	5		2	1	6	4	83
Pleurisy	31			1																		1						2
Other Diseases of Respiratory System	29							1							2													3
ORDER 5. OF DIGESTIVE SYSTEM.																											
Stomatitis	7																								1			1
Dentition	30																										1	1
Quinsy	10												1															1
Dyspepsia	25							1																		1		2
Hæmatemesis	5																					1						1
Disease of Stomach	136				1	1		1						1								1				1		6
Ulcer of Stomach	22							1																				1
Enteritis	131					1										1		1			1							4
Ulceration of Intestines	9																											
Obstruction of Intestines	31																					1				1		2
Strangulation of Intestines	5																					1						1
Intussusception of Intestines	7																											
Hernia	22																									1		1
Fistula	2																											
Peritonitis (not puerperal)	120							1					2	1			1		2	1		2						10
Ascites	11																											
Gallstones	4																											
Cirrhosis of Liver	48							1																1				2
Other Diseases of Liver	52				1																	1				1		3
Hepatitis	34														1													1
Jaundice	17																											
Other Diseases of Digestive System	21	1																							2	1		4

TABLE VI.—CONTINUED. LITCHFIELD COUNTY.

CAUSES OF DEATH.	STATE.	Litchfield.	Barkhamsted.	Bethlehem.	Bridgewater.	Canaan.	Colebrook.	Cornwall.	Goshen.	Harwinton.	Kent.	Morris.	New Hartford.	New Milford.	Norfolk.	North Canaan.	Plymouth.	Roxbury.	Salisbury.	Sharon.	Thomaston.	Torrington.	Warren.	Washington.	Watertown.	Winchester.	Woodbury.	TOTAL.
ORDER 6. OF LYMPHATIC SYSTEM AND DUCTLESS GLANDS.																												
Bronchocele	1														1													1
ORDER 7. OF URINARY SYSTEM.																												
Nephritis	76	2																			1	1						4
Bright's Disease	294	4				1	1				1			2	3	1					1	2		2	2	4		24
Uræmia	39												1				1				1					1		4
Suppression of Urine	1																											
Calculus	4																											
Hæmaturia	12	2					1																					3
Disease of Bladder	55					1					1		1										1	1				5
Prostatitis	8																1	1										2
Other Diseases of Urinary System	18	1	2																1					1				5

ORDER 8. OF GENERATIVE SYSTEM.																												
A. Diseases of the Reproductive Organs.																												
Diseases of the Uterus	12																				1						1
Metritis	2																											
Disease of Ovaries	12	2																									2
Pelvic Abscess	1					1																					1
Perineal Abscess	1																											
B. Diseases of Parturition.																												
Abortion and Miscarriage	6																											
Puerperal Mania	5																			1							1
Puerperal Convulsions	10																											
Puerperal Hemorrhage	5																				1						1
Placenta Previa	3																											
Other Accidents of Childbirth	50									1											1	1				1	4
ORDER 9. OF ORGANS OF LOCOMOTION.																												
Caries, Necrosis	7													1											1			2
Arthritis, Periostitis	3																											
Other Diseases of Organs of Locomotion	1																											
ORDER 10. OF INTEGUMENTARY SYSTEM.																												
Carbuncles	4																											
Other Diseases of Integumentary System	10																											

TABLE VI.—CONTINUED. LITCHFIELD COUNTY.

CAUSES OF DEATH.	STATE.	Litchfield.	Barkhamsted.	Bethlehem.	Bridgewater.	Canaan.	Colebrook.	Cornwall.	Goshen.	Harwinton.	Kent.	Morris.	New Hartford.	New Milford.	Norfolk.	North Canaan.	Plymouth.	Roxbury.	Salisbury.	Sharon.	Thomaston.	Torrington.	Warren.	Washington.	Watertown.	Winchester.	Woodbury.	TOTAL.
CLASS VII.—Violence.																												
ORDER 1. ACCIDENT OR NEGLIGENCE.																												
Fractures and Contusions	36	1																										1
Fractures and Contusions of Skull	29																											
Railroad Injuries	146							1			2					1			1		1					3		9
Gun-shot Wound	4																											
Burns and Scalds	38				1						1											1						3
Poisoned	15																											
Drowning	71								1					1					1	2	1	2						8
Suffocation	14																		1									1
Other Accidents	56		1							2										2								5
Falling	52													1		1						1					1	4
ORDER 2. HOMICIDE.																												
Murder	5													1														1
Manslaughter	1													1														1

ORDER 3. SUICIDE.																												
Gun-shot Wounds	17														1													1
Cut, Stab	12												1					1		1								3
Poisoned	8																											
By Opium	6																											
Drowning	27														2													2
Hanging	16																											
Otherwise	7																											
CLASS VIII.—Unclassified.																												
Tumor	31																								1			1
Dropsy	74							1			1			1				1			1	1						6
Debility, Atrophy, Inanition	318													2							1					6		9
Sunstroke	12																											
Exhaustion	41										1			2					1							1		5
Hemorrhage	41										1															1		2
Abscess	23													1														1
Sudden Deaths	10																											
Surgical Operation	4																											
Other ill-defined causes	198	2		1	3					1			4	1	1	1						7				1	1	23
Cause not stated	33																					1						1

RECAPITULATION OF LITCHFIELD COUNTY.

CLASSIFIED DISEASES.	STATE.	Litchfield.	Barkhamsted.	Bethlehem.	Bridgewater.	Canaan.	Colebrook.	Cornwall.	Goshen.	Harwinton.	Kent.	Morris.	New Hartford.	New Milford.	Norfolk.	North Canaan.	Plymouth.	Roxbury.	Salisbury.	Sharon.	Thomaston.	Torrington.	Warren.	Washington.	Watertown.	Winchester.	Woodbury.	TOTAL.
All causes	13665	50	26	9	13	19	12	20	17	13	23	4	71	61	32	23	29	25	63	38	43	81	6	26	30	92	36	862
CLASSES.																												
I. Zymotic Diseases	2658	2	3			4	3	1	6	2	2	1	27	12	2	7	7	4	5	7	9	21		4	6	14	6	155
II. Parasitic Diseases																												
III. Dietetic Diseases	74																		1	2								3
IV. Constitutional Diseases	2375	6	1	2		1	1	3	3		5	2	10	9	5	2	6	2	10	5	12	13	2	3	5	17	6	131
V. Developmental Diseases	897	3	2		2	1	2	1	4	1	2		3	5	4	2	1	5	8	3	1	4			1	5	6	66
VI. Local Diseases	6316	36	19	6	7	13	6	13	3	7	8	1	26	24	17	9	15	12	35	16	17	31	3	19	18	43	16	420
VII. Violence	560	1	1		1			1	1	2	3		1	4	3	2		1	3	5	2	4				3	1	39
VIII. Ill Defined and cause not stated	785	2		1	3			1		1	3		4	7	1	1		1	1		2	8	1			10	1	48
Class I. Orders.																												
1. Miasmatic Diseases	1342	1	2			2	3		4	1	2		8	5		5	4	4	1	4	3	7		2	3	7	5	73
2. Diarrhœal Diseases	1090		1					1	1	1		1	19	7	2	2	2		4	1	6	12		2	3	6	1	72
3. Malarial Diseases	79	1																				1				1		3
4. Zoogenous Diseases	1																											
5. Venereal Diseases	11																											
6. Septic	135					2			1								1			2	1							7
Class II. Orders.																												
Parasitic Diseases																												

Class III. Orders.																												
Dietetic Diseases	74																		1	2								3
Class IV. Orders.																												
Constitutional Diseases	2375	6	1	2		1	1	3	3		5	2	10	9	5	2	6	2	10	5	12	13	2	3	5	17	6	131
Class V. Orders.																												
Developmental Diseases	897	3	2		2	1	2	1	4	1	2		3	5	4	2	1	5	8	3	1	4			1	5	6	66
Class VI. Orders.																												
1. Diseases of Nervous System	1839	10	6	3		5	1	3	2	3		1	5	11	6	2	2	1	9	4	3	8	2	5	6	18	8	124
2. Organs of Special Sense	5																											
3. Circulatory System	1088	9	4	1	3		2	3	1	3	3		1	3	2	3	3	2	9	5	2	4		6	4	7	2	82
4. Respiratory System	1995	5	7	2	2	3	1	2			3		15	5	4	2	7	7	14	5	6	7		3	2	7	4	113
5. Digestive System	749	1			2	2		5					3	2	1	1	1	1	2	1	1	7		1	3	6	1	41
6. Lymphatic Syst. and Ductless Glands	1														1													1
7. Urinary System	507	9	2			2	2				2		2	2	3	1	2	1	1		3	3	1	4	2	5		47
8. Generative System	107	2				1				1										1	2	2					1	10
9. Organs of Locomotion	11													1											1			2
10. Integumentary System	14																											
Class VII. Orders.																												
1. Accident or Negligence	461	1	1		1			1	1	2	3			2		2			3	4	2	4				3	1	31
2. Homicide	6													2														2
3. Suicide	93												1		3			1		1								6
Class VIII. Orders.																												
1. Ill Defined	752	2		1	3			1		1	3		4	7	1	1		1	1		2	8				10	1	47
2. Cause not stated	33																						1					1

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TABLE VI.—Continued.

MIDDLESEX COUNTY.

CAUSES OF DEATH.	STATE.	Middletown.	Haddam.	Chatham.	Chester.	Clinton.	Cromwell.	Durham.	East Haddam.	Essex.	Killingworth.	Middlefield.	Old Saybrook.	Portland.	Saybrook.	Westbrook.	TOTAL.
CLASS I.—Zymotic Diseases.																	
ORDER 1. MIASMATIC.																	
Small Pox	12																
Chicken Pox	1																
Measles	18																
Scarlet Fever	67										1						1
Typhus Fever	3		2														2
Influenza	185	4		1			1						1	1			8
Typhoid Fever	312	21		3		1	4	1						1			31
Cerebro-Spinal Fever	22				1												1
Continued Fever	17	1															1
Whooping Cough	137	3											1	8			12
Diphtheria	435					1										1	2
Membranous Croup	122	1												2			3
Mumps	1																
Other Miasmatic Diseases	10						1										1

Order 2. Diarrhœal.																	
Cholera Infantum	660	15		1			3						1	7	1	2	30
Infantile Diarrhœa	219	3															3
Cholera Morbus	29	1															1
Dysentery	98	4											1				5
Diarrhœa	84	1	1						2	1							5
Order 3. Malarial.																	
Intermittent Fever	7								1								1
Remittent Fever	16																
Pernicious or Congestive Fever	9					2								1			3
Other Malarial Diseases	47	1			1	1							1	1			5
Order 4. Zoogenous.																	
Hydrophobia	1																
Order 5. Venereal.																	
Syphilis	10	1															1
Gonorrhœa, Stricture of Urethra	1																
Order 6. Septic.																	
Phagedena	1																
Erysipelas	45	2						1									3
Pyæmia, Septicæmia	39						1										1
Puerperal Fever	50	1												1			2
CLASS II.—Parasitic Diseases.																	
CLASS III.—Dietetic Diseases.																	
Starvation	2																
Intemperance	14	1															1
Chronic Alcoholism	56									1							1
Delirium Tremens	2																

TABLE VI.—CONTINUED. MIDDLESEX COUNTY.

CAUSES OF DEATH.	STATE.	Middletown.	Haddam.	Chatham.	Chester.	Clinton.	Cromwell.	Durham.	East Haddam.	Essex.	Killingworth.	Middlefield.	Old Saybrook.	Portland.	Saybrook.	Westbrook.	TOTAL.
CLASS IV.—Constitutional Diseases.																	
Rheumatism	109	1				1			1	1				1			5
Cancer of Breast	45			1							1						2
Cancer of Stomach	65	2		1					1								4
Cancer of Womb	38	1												1			2
Cancer of other organs	213	2	2	1		1	1			1				2			10
Tabes Mesenterica	63	9												4			13
Tubercular Meningitis, Acute Hydrocephalus	92						1									1	2
Phthisis	1544	52	1	6		3	3		8	2		3	3	7		2	90
Other forms of Tuberculosis	60							1							1		2
Scrofula	31							1		1							2
Pott's Disease	2																
Hip-Joint Disease	5																
Purpura	10																
Anæmia	31			1										1			2
Diabetes	62	2				1			1		1						5
Other Constitutional Diseases	5					1											1

CLASS V.—Developmental Diseases.																	
Premature Birth	200	1	1						3	1				1	1		8
Atelectasis	11																
Cyanosis	20																
Spina Bifida	9																
Imperforate Anus	1																
Other Congenital Malformations	14	1															1
Umbilical Hemorrhage	4				1												1
Old Age	638	18	4	1	3			2	6	1	1	1	1	9	6	2	55
CLASS VI.—Local Diseases.																	
ORDER 1. OF NERVOUS SYSTEM.																	
Inflammation of Brain or its Membranes	327	3		1			2	3							1		10
Apoplexy	542	11	4	3		2	1		2	4			3	2		1	33
Softening of Brain	91		1						1				2				4
Hydrocephalus, not acute	25	3								1				2			6
Hemiplegia	31	2				1											3
Paralysis Agitans	37					1											1
Insanity	76	23					7			2					1	1	34
Chorea	4	1															1
Epilepsy	47	8										1					9
Convulsions	281	6		1			1	1						6			15
Trismus Nascentium	14																
Tetanus	17												1			1	2
Paraplegia	10																
Diseases of Spinal Cord	16											1					1
Myelitis	10	1															1
Spinal Meningitis	33													1			1
Locomotor Ataxia	7																
Other Diseases of Nervous System	271	12		4	2	5			1		1		1	3	2		31

TABLE VI.—CONTINUED. MIDDLESEX COUNTY.

CAUSES OF DEATH.	STATE.	Middletown.	Haddam.	Chatham.	Chester.	Clinton.	Cromwell.	Durham.	East Haddam.	Essex.	Killingworth.	Middlefield.	Old Saybrook.	Portland.	Saybrook.	Westbrook.	TOTAL.
ORDER 2. OF ORGANS OF SPECIAL SENSE.																	
Otitis	3	1															1
Other Diseases of Eye, Ear or Nose	2																
ORDER 3. OF CIRCULATORY SYSTEM.																	
Endocarditis	55																
Valvular Disease of Heart	177	13			1												14
Disease of Heart	466	17	9								1		2	6			35
Pericarditis	30									1							1
Hypertrophy of Heart	70	1		3													4
Angina Pectoris	59	1							1						3		5
Syncope	14																
Aneurism	12																
Senile Gangrene	15															1	1
Thrombosis, Embolism	63					2	1		4								7
Phlebitis	1																
Other Diseases of Circulatory System	126	5			4	2	1	1	1	1				6			21

Order 4. Of Respiratory System.																	
Laryngitis	17																
Catarrhal Croup	1																
Other Diseases of Larynx or Trachea	5		3														3
Emphysema, Asthma	27	1															1
Bronchitis	455	6	1	1			3			1		2		3			17
Pneumonia	1430	21	8	1	2	1	9		4	1	2		3	8	1	1	62
Pleurisy	31			1													1
Other Diseases of Respiratory System	29		1		1												2
Order 5. Of Digestive System.																	
Stomatitis	7																
Dentition	30		1		1												2
Quinsy	10																
Dyspepsia	25	2								1							3
Hæmatemesis	5											1					1
Disease of Stomach	136	3	1	1			2				1						8
Ulcer of Stomach	22																
Enteritis	131	1							1	1						1	4
Ulceration of Intestines	9																
Obstruction of Intestines	31	1			1					1					1		4
Strangulation of Intestines	5																
Intussusception of Intestines	7																
Hernia	22				1												1
Fistula	2																
Peritonitis (not puerperal)	120	1						1	1					3			6
Ascites	11										1						1
Gallstones	4																
Cirrhosis of Liver	48	1					1										2
Other Diseases of Liver	52																
Hepatitis	34	1															1
Jaundice	17								1								1
Other Diseases of Digestive System	21		1											1			2

TABLE VI.—CONTINUED. MIDDLESEX COUNTY.

CAUSES OF DEATH.	STATE.	Middletown.	Haddam.	Chatham.	Chester.	Clinton.	Cromwell.	Durham.	East Haddam.	Essex.	Killingworth.	Middlefield.	Old Saybrook.	Portland.	Saybrook.	Westbrook.	TOTAL.
ORDER 6. OF LYMPHATIC SYSTEM AND DUCTLESS GLANDS.																	
Bronchocele	1																
ORDER 7. OF URINARY SYSTEM.																	
Nephritis	76	1	1						1	1							4
Bright's Disease	294	7		1		2			1	2				1			14
Uræmia	39	1									1						2
Suppression of Urine	1																
Calculus	4																
Hæmaturia	12																
Disease of Bladder	55									1		1					2
Prostatitis	8	1															1
Other Diseases of Urinary System	18																

ORDER 8. OF GENERATIVE SYSTEM.																	
A. *Diseases of the Reproductive Organs.*																	
Diseases of the Uterus	12	1			1					1							3
Metritis	2																
Diseases of Ovaries	12																
Pelvic Abscess	1																
Perineal Abscess	1																
B. *Diseases of Parturition.*																	
Abortion and Miscarriage	6		1														1
Puerperal Mania	5	2															2
Puerperal Convulsions	10																
Puerperal Hemorrhage	5									2							2
Placenta Previa	3																
Other Accidents of Childbirth	50	3								2							5
ORDER 9. OF ORGANS OF LOCOMOTION.																	
Caries, Necrosis	7																
Arthritis, Periostitis	3																
Other Diseases of Organs of Locomotion	1																
ORDER 10. OF INTEGUMENTARY SYSTEM.																	
Carbuncles	4									1							1
Other Diseases of Integumentary System	10																

TABLE VI.—CONTINUED. MIDDLESEX COUNTY.

CAUSES OF DEATH.	STATE.	Middletown.	Haddam.	Chatham.	Chester.	Clinton.	Cromwell.	Durham.	East Haddam.	Essex.	Killingworth.	Middlefield.	Old Saybrook.	Portland.	Saybrook.	Westbrook.	TOTAL.
CLASS VII.—Violence.																	
ORDER 1. ACCIDENT OR NEGLIGENCE.																	
Fractures and Contusions	36	2							1		1		1				5
Fractures and Contusions of Skull	29	1					1										2
Railroad Injuries	146	1					1						1				3
Gun-shot Wound	4																
Burns and Scalds	38	2							1								3
Poisoned	15	2															2
Drowning	71	2	2		1		1		2								8
Suffocation	14																
Other Accidents	56			1					1								2
Falling	52			3												1	4
ORDER 2. HOMICIDE.																	
Murder	5																
Manslaughter	1																

ORDER 3. SUICIDE.																	
Gun-shot Wounds	17																
Cut, Stab	12																
Poisoned	8																
By Opium	6																
Drowning	27													3			3
Hanging	16	1															1
Otherwise	7																
CLASS VIII.—Unclassified.																	
Tumor	31							1					1		1		3
Dropsy	74	2	1				1			1				1		1	7
Debility, Atrophy, Inanition	318	5									1			2			8
Sunstroke	12	2															2
Exhaustion	41			1								1					2
Hemorrhage	41								1	1							2
Abscess	23																
Sudden Death	10				1	1							1				3
Surgical Operation	4																
Other ill-defined causes	198		1	2	1	2	1		1	1			1	1			11
Cause not stated	33	1								1				1	1	1	5

RECAPITULATION OF MIDDLESEX COUNTY.

CLASSIFIED DISEASES.	STATE.	Middletown.	Haddam.	Chatham.	Chester.	Clinton.	Cromwell.	Durham.	East Haddam.	Essex.	Killingworth.	Middlefield.	Old Saybrook.	Portland.	Saybrook.	Westbrook.	TOTAL.
All causes	13665	332	47	40	23	31	48	13	49	37	13	11	26	98	20	17	805
CLASSES.																	
I. Zymotic Diseases	2658	59	3	5	2	5	10	2	3	1	1	....	5	22	1	3	122
II. Parasitic Diseases	......	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	......
III. Dietetic Diseases	74	1	....	....	....	....	....	....	....	1	....	....	....	....	....	....	2
IV. Constitutional Diseases	2375	69	3	10	....	7	5	2	11	5	2	3	3	16	1	3	140
V. Developmental Diseases	897	20	5	1	4	....	....	2	9	2	1	1	1	10	7	2	65
VI. Local Diseases	6316	162	32	17	14	16	28	6	19	24	7	6	12	42	9	6	400
VII. Violence	560	11	2	4	1	....	3	....	5	....	1	....	2	3	....	1	33
VIII. Ill Defined and cause not stated	785	10	2	3	2	3	2	1	2	4	1	1	3	5	2	2	43
Class I. Orders.																	
1. Miasmatic Diseases	1342	30	2	4	1	2	6	1	....	....	1	....	2	12	....	1	62
2. Diarrhœal Diseases	1090	24	1	1	....	....	3	....	2	1	....	....	2	7	1	2	44
3. Malarial Diseases	79	1	....	....	1	3	....	....	1	....	....	....	1	2	....	....	9
4. Zoogenous Diseases	1	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	......
5. Venereal Diseases	11	1	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1
6. Septic	135	3	....	....	....	....	1	1	....	....	....	....	....	1	....	....	6
Class II. Orders.																	
Parasitic Diseases	......	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	......

Class III. Orders.																	
Dietetic Diseases	74	1	....	....	....	....	....	....	....	1	....	....	....	....	....	....	2
Class IV. Orders.																	
Constitutional Diseases	2375	69	3	10	....	7	5	2	11	5	2	3	3	16	1	3	140
Class V. Orders.																	
Developmental Diseases	897	20	5	1	4	....	....	2	9	2	1	1	1	10	7	2	65
Class VI. Orders.																	
1. Diseases of Nervous System	1839	70	5	9	2	9	11	4	4	7	1	2	7	14	4	3	152
2. Organs of Special Sense	5	1	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1
3. Circulatory System	1088	37	9	3	5	4	2	1	6	2	1	....	2	12	3	1	88
4. Respiratory System	1995	28	13	3	3	1	12	....	4	2	2	2	3	11	1	1	86
5. Digestive System	749	10	3	1	3	....	3	1	3	3	2	1	....	4	1	1	36
6. Lymphatic Syst. and Ductless Glands	1	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
7. Urinary System	507	10	1	1	....	2	....	....	2	4	1	1	....	1	....	....	23
8. Generative System	107	6	1	....	1	....	....	....	....	5	....	....	....	....	....	....	13
9. Organs of Locomotion	11	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
10. Integumentary System	14	....	....	....	....	....	....	....	....	1	....	....	....	....	....	....	1
Class VII. Orders.																	
1. Accident or Negligence	461	10	2	4	1	....	3	....	5	....	1	....	2	....	....	1	29
2. Homicide	6	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
3. Suicide	93	1	....	....	....	....	....	....	....	....	....	....	....	3	....	....	4
Class VIII. Orders.																	
1. Ill Defined	752	9	2	3	2	3	2	1	2	3	1	1	3	4	1	1	38
2. Cause not stated	33	1	....	....	....	....	....	....	....	1	....	....	....	1	1	1	5

TABLE VI.—Continued.

TOLLAND COUNTY.

CAUSES OF DEATH.	STATE.	Tolland.	Andover.	Bolton.	Columbia.	Coventry.	Ellington.	Hebron.	Mansfield.	Somers.	Stafford.	Union.	Vernon.	Willington.	TOTAL.
CLASS I.—Zymotic Diseases.															
ORDER 1. MIASMATIC.															
Small Pox	12														
Chicken Pox	1														
Measles	18								1						1
Scarlet Fever	67								2						2
Typhus Fever	3												1		1
Influenza	185										1				1
Typhoid Fever	312				1			1		1	7				10
Cerebro-Spinal Fever	22						1								1
Continued Fever	17														
Whooping Cough	137										1		1		2
Diphtheria	435									1		1	2		4
Membranous Croup	122										1		1		2
Mumps	1														
Other Miasmatic Diseases	10														

ORDER 2. DIARRHŒAL.															
Cholera Infantum	660					2		2		1	7		12		24
Infantile Diarrhœa	219					3	1						2	1	7
Cholera Morbus	29												1		1
Dysentery	98										1		1		2
Diarrhœa	84									1	1		1		3
ORDER 3. MALARIAL.															
Intermittent Fever	7														
Remittent Fever	16														
Pernicious or Congestive Fever	9														
Other Malarial Diseases	47														
ORDER 4. ZOOGENOUS.															
Hydrophobia	1														
ORDER 5. VENEREAL.															
Syphilis	10														
Gonorrhœa, Stricture of Urethra	1														
ORDER 6. SEPTIC.															
Phagedena	1														
Erysipelas	45														
Pyæmia, Septicæmia	39						1						1		2
Puerperal Fever	50					2							2		4
CLASS II.—Parasitic Diseases.															
CLASS III.—Dietetic Diseases.															
Starvation	2														
Intemperance	14														
Chronic Alcoholism	56												1		1
Delirium Tremens	2														

TABLE VI.—CONTINUED. TOLLAND COUNTY.

CAUSES OF DEATH.	STATE.	Tolland.	Andover.	Bolton.	Columbia.	Coventry.	Ellington.	Hebron.	Mansfield.	Somers.	Stafford.	Union.	Vernon.	Willington.	TOTAL.
CLASS IV.—Constitutional Diseases.															
Rheumatism	109					2					1		1	1	5
Cancer of Breast	45								1						1
Cancer of Stomach	65				1				1						2
Cancer of Womb	38										1				1
Cancer of other organs	213					2			1		2		1		6
Tabes Mesenterica	63												5		5
Tubercular Meningitis, Acute Hydrocephalus	92				1		1	1					1		4
Phthisis	1544	1			2	3	3		1	2	5	1	23	5	46
Other forms of Tuberculosis	60					2			1		2				5
Scrofula	31										2				2
Pott's Disease	2														
Hip-Joint Disease	5														
Purpura	10														
Anæmia	31												1		1
Diabetes	62						1								1
Other Constitutional Diseases	5														

CLASS V.—Developmental Diseases.															
Premature Birth	200					1				1			1		3
Atelectasis	11														
Cyanosis	20														
Spina Bifida	9												1		1
Imperforate Anus	1														
Other Congenital Malformations	14														
Umbilical Hemorrhage	4														
Old Age	638		1	1	2		3	2	2		4	1	6	2	24
CLASS VI.—Local Diseases.															
ORDER 1. OF NERVOUS SYSTEM.															
Inflammation of Brain or its Membranes	327				1	1			1		1		2	1	7
Apoplexy	542		2		3	1	1	1	2		6		3	3	22
Softening of Brain	91														
Hydrocephalus, not acute	25										1		1		2
Hemiplegia	31												1		1
Paralysis Agitans	37				2										2
Insanity	76										1				1
Chorea	4														
Epilepsy	47									1					1
Convulsions	281			1			2		1		1		8		13
Trismus Nascentium	14														
Tetanus	17														
Paraplegia	10														
Diseases of Spinal Cord	16														
Myelitis	10														
Spinal Meningitis	33			1						1					2
Locomotor Ataxia	7														
Other Diseases of Nervous System	271		1		1				1				4		7

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TABLE VI.—CONTINUED. TOLLAND COUNTY.

CAUSES OF DEATH.	STATE.	Tolland.	Andover.	Bolton.	Columbia.	Coventry.	Ellington.	Hebron.	Mansfield.	Somers.	Stafford.	Union.	Vernon.	Willington.	TOTAL.
ORDER 2. OF ORGANS OF SPECIAL SENSE.															
Otitis	3														
Other Diseases of Eye, Ear or Nose	2														
ORDER 3. OF CIRCULATORY SYSTEM.															
Endocarditis	55	1									3		5		9
Valvular Disease of Heart	177	1					1								2
Disease of Heart	466	2				3		4		3		1	12	1	26
Pericarditis	30														
Hypertrophy of Heart	70														
Angina Pectoris	59	1									1				2
Syncope	14														
Aneurism	12														
Senile Gangrene	15	1			1										2
Thrombosis, Embolism	63					1								1	2
Phlebitis	1														
Other Diseases of Circulatory System	126						2		3		2		1		8

Order 4. Of Respiratory System.															
Laryngitis	17														
Catarrhal Croup	1														
Other Diseases of Larynx or Trachea	5														
Emphysema, Asthma	27											1		1
Bronchitis	455				1				2				2		1
Pneumonia	1430	3			2	8	1	1	3	2	5		10		35
Pleurisy	31						1								1
Other Diseases of Respiratory System	29														
Order 5. Of Digestive System.															
Stomatitis	7														
Dentition	30														
Quinsy	10														
Dyspepsia	25						1				1				2
Hæmatemesis	5										1		1		2
Disease of Stomach	136								1				2		3
Ulcer of Stomach	22														
Enteritis	131						1			1					2
Ulceration of Intestines	9														
Obstruction of Intestines	31				1										1
Strangulation of Intestines	5														
Intussusception of Intestines	7														
Hernia	22														
Fistula	2														
Peritonitis (not puerperal)	120									1	2				3
Ascites	11														
Gallstones	4														
Cirrhosis of Liver	48										1				1
Other Diseases of Liver	52						1								1
Hepatitis	34												1		1
Jaundice	17														
Other Diseases of Digestive System	21														

TABLE VI.—CONTINUED. TOLLAND COUNTY.

CAUSES OF DEATH.	STATE.	Tolland.	Andover.	Bolton.	Columbia.	Coventry.	Ellington.	Hebron.	Mansfield.	Somers.	Stafford.	Union.	Vernon.	Willington.	TOTAL.
ORDER 6. OF LYMPHATIC SYSTEM AND DUCTLESS GLANDS.															
Bronchocele	1														
ORDER 7. OF URINARY SYSTEM.															
Nephritis	76					2									2
Bright's Disease	294	1				1		3	3				2		10
Uræmia	39														
Suppression of Urine	1														
Calculus	4														
Hæmaturia	12														
Disease of Bladder	55										1				1
Prostatitis	8														
Other Diseases of Urinary System	18														

ORDER 8. OF GENERATIVE SYSTEM.															
A. Diseases of the Reproductive Organs.															
Diseases of the Uterus	12														
Metritis	2														
Disease of Ovaries	12										1				1
Pelvic Abscess	1														
Perineal Abscess	1														
B. Diseases of Parturition.															
Abortion and Miscarriage	6														
Puerperal Mania	5														
Puerperal Convulsions	10														
Puerperal Hemorrhage	5														
Placenta Previa	3														
Other Accidents of Childbirth	50												1		1
ORDER 9. OF ORGANS OF LOCOMOTION.															
Caries, Necrosis	7														
Arthritis, Periostitis	3														
Other Diseases of Organs of Locomotion	1														
ORDER 10. OF INTEGUMENTARY SYSTEM.															
Carbuncles	4														
Other Diseases of Integumentary System	10														

TABLE VI—CONTINUED. TOLLAND COUNTY.

CAUSES OF DEATH.	STATE.	Tolland.	Andover.	Bolton.	Columbia.	Coventry.	Ellington.	Hebron.	Mansfield.	Somers.	Stafford.	Union.	Vernon.	Willington.	TOTAL.
CLASS VII.—Violence.															
ORDER 1. ACCIDENT OR NEGLIGENCE.															
Fractures and Contusions	36		1												1
Fractures and Contusions of Skull	29														
Railroad Injuries	146														
Gun-shot Wound	4														
Burns and Scalds	38														
Poisoned	15														
Drowning	71						1								1
Suffocation	14						1								1
Other Accidents	56														
Falling	52										1				1
ORDER 2. HOMICIDE.															
Murder	5														
Manslaughter	1														

ORDER 3. SUICIDE.															
Gun-shot Wounds	17														
Cut, Stab	12														
Poisoned	8														
By Opium	6														
Drowning	27										1				1
Hanging	16														
Otherwise	7														
CLASS VIII.—Unclassified.															
Tumor	31														
Dropsy	74	1			1		1						3		6
Debility, Atrophy, Inanition	318			1							3		2		6
Sunstroke	12														
Exhaustion	41		1												1
Hemorrhage	41	1				1				1				1	4
Abscess	23														
Sudden Deaths	10														
Surgical Operation	4														
Other ill-defined causes	198		1		1		4				1		4		11
Cause not stated	33													1	1

RECAPITULATION OF TOLLAND COUNTY.

CLASSIFIED DISEASES.	STATE.	Tolland.	Andover.	Bolton.	Columbia.	Coventry.	Ellington.	Hebron.	Mansfield.	Somers.	Stafford.	Union.	Vernon.	Willington.	TOTAL.
All causes	13665	13	7	4	21	35	29	15	27	17	70	4	132	17	391
CLASSES.															
I. Zymotic Diseases	2658				1	7	3	3	3	4	19	1	25	1	67
II. Parasitic Diseases															
III. Dietetic Diseases	74												1		1
IV. Constitutional Diseases	2375	1			4	9	5	1	5	2	13	1	32	6	79
V. Developmental Diseases	897		1	1	2	1	3	2	2	1	4	1	8	2	28
VI. Local Diseases	6316	10	3	2	12	17	11	9	17	9	28	1	57	6	182
VII. Violence	560		1				2				2				5
VIII. Ill Defined and cause not stated	785	2	2	1	2	1	5			1	4		9	2	29
Class I. Orders.															
1. Miasmatic Diseases	1342				1		1	1	3	2	10	1	5		24
2. Diarrhœal Diseases	1090					5	1	2		2	9		17	1	37
3. Malarial Diseases	79														
4. Zoogenous Diseases	1														
5. Venereal Diseases	11														
6. Septic	135					2	1						3		6
Class II. Orders.															
Parasitic Diseases															

Class III. Orders.															
Dietetic Diseases	74												1		1
Class IV. Orders.															
Constitutional Diseases	2375	1			4	9	5	1	5	2	13	1	32	6	79
Class V. Orders.															
Developmental Diseases	897		1	1	2	1	3	2	2	1	4	1	8	2	28
Class VI. Orders.															
1. Diseases of Nervous System	1839		3	2	7	2	3	1	5	2	10		19	4	58
2. Organs of Special Sense	5														
3. Circulatory System	1088	6			1	4	3	4	3	3	6	1	18	2	51
4. Respiratory System	1995	3			3	8	2	1	5	2	5		15		42
5. Digestive System	749				1		3		1	2	5		4		16
6. Lymphatic Syst. and Ductless Glands	1														
7. Urinary System	507	1				3		3	3		1		2		13
8. Generative System	107										1		1		2
9. Organs of Locomotion	11														
10. Integumentary System	14														
Class VII. Orders.															
1. Accident or Negligence	461		1				2				1				4
2. Homicide	6														
3. Suicide	93										1				1
Class VIII. Orders.															
1. Ill Defined	752	2	2	1	2	1	5			1	4		9	1	28
2. Cause not stated	33													1	1

RECAPITULATION OF TABLE VI.

CLASSIFIED DISEASES.	STATE.	Hartford Co.	New Haven Co.	New London Co.	Fairfield Co.	Windham Co.	Litchfield Co.	Middlesex Co.	Tolland Co.	Per cent to Total Mortality.	TOTAL, 1889.
All causes	13665	2746	3948	1444	2626	843	862	805	391	100.0	12529
CLASSES.											
I. Zymotic Diseases	2658	531	892	249	470	172	155	122	67	19.4	2602
II. Parasitic Diseases											1
III. Dietetic Diseases	74	28	17	4	17	2	3	2	1	.54	57
IV. Constitutional Diseases	2375	463	717	259	448	138	131	140	79	17.3	2220
V. Developmental Diseases	897	184	230	116	140	68	66	65	28	6.5	1000
VI. Local Diseases	6316	1262	1745	657	1270	380	420	400	182	46.2	5192
VII. Violence	560	116	180	48	115	24	39	33	5	4.0	580
VIII. Ill Defined and cause not stated	785	162	167	111	166	59	48	43	29	5.07	877
Class I. Orders.											
1. Miasmatic Diseases	1342	304	449	118	237	75	73	62	24	9.8	1356
2. Diarrhœal Diseases	1090	184	368	114	190	81	72	44	37	7.9	999
3. Malarial Diseases	79	13	28	7	14	5	3	9		.57	117
4. Zoogenous Diseases	1	1									1
5. Venereal Diseases	11	4	3	1	2			1		.08	7
6. Septic	135	25	44	9	27	11	7	6	6	.98	122
Class II. Orders.											
Parasitic Diseases											1

Class III. Orders.											
Dietetic Diseases	74	28	17	4	17	2	3	2	1	.54	57
Class IV. Orders.											
Constitutional Diseases	2375	463	717	259	448	138	131	140	79	17.3	2220
Class V. Orders.											
Developmental Diseases	897	184	230	116	140	68	66	65	28	6.5	1000
Class VI. Orders.											
1. Diseases of Nervous System	1839	327	514	204	355	105	124	152	58	13.4	1609
2. Organs of Special Sense	5	1	1	......	2	......	......	1	......	.03	2
3. Circulatory System	1088	229	220	131	204	83	82	88	51	7.9	928
4. Respiratory System	1995	451	641	163	394	105	113	86	42	14.5	1379
5. Digestive System	749	118	210	94	187	47	41	36	16	5.4	662
6. Lymphatic System and Ductless Glands	1	......	......	......	......	......	1	......	......	......	8
7. Urinary System	507	111	121	56	109	27	47	23	13	3.7	470
8. Generative System	107	23	29	6	14	10	10	13	2	.77	105
9. Organs of Locomotion	11	2	3	......	3	1	2	......	......	.08	14
10. Integumentary System	14	......	6	3	2	2	......	1	......	.10	15
Class VII. Orders.											
1. Accident or Negligence	461	96	146	39	96	20	31	29	4	3.3	490
2. Homicide	6	2	1	......	1	......	2	......	......	.04	7
3. Suicide	93	18	33	9	18	4	6	4	1	.68	82
4. Execution	......	......	......	......	......	......	......	......	......	......	1
Class VIII. Orders.											
1. Ill Defined	752	150	163	109	161	56	47	38	28	5.5	821
2. Cause not stated	33	12	4	2	5	3	1	5	1	.24	56

TABLE VII.

NOSOLOGICAL ARRANGEMENT BY COUNTIES, WITH COMPARATIVE MORTALITY FOR TEN YEARS.

NOTE.—Some of the blank spaces in the following table are due to different methods of tabulating diseases in the previous reports: for example, some reports call all cases of Diarrhœa in children Cholera Infantum, others call them Infantile Diarrhœa. Again, in some reports Cholera Morbus is included with Diarrhœa, in others they are separately counted.

CAUSES OF DEATH.	Hartford Co.	New Haven Co.	New London Co.	Fairfield Co.	Windham Co.	Litchfield Co.	Middlesex Co.	Tolland Co.	1890, Total.	Per cent. to Total Mortality.	1889, Total.	1888, Total.	1887, Total.	1886, Total.	1885, Total.	1884, Total.	1883, Total.	1882, Total.	1881, Total.	Aggregate for Ten Years.	Average for Ten Years.
CLASS I.—Zymotic Diseases.																					
ORDER 1 MIASMATIC.																					
Small Pox	2	10							12	.08		4	4				8	9	31	68	6.8
Chicken Pox					1				1		1	1	2							5	.5
Measles	2	2	4	5	4			1	18	.13	62	41	95	9	154	45	104	48	14	590	59.0
Scarlet Fever	12	17	4	23	2	6	1	2	67	.49	81	140	117	117	286	208	303	352	121	1792	179.2
Typhus Fever							2	1	3	.02	8	8	5		7					31	3.1
Relapsing Fever											1	1	1							3	.3
Influenza	51	31	28	36	13	17	8	1	185	1.35	4	9	4	3	8					213	21.3
Typhoid Fever	64	103	24	42	17	21	31	10	312	2.28	281	292	195	244	227	281	291	324	257	2704	270.4
Cerebro-Spinal Fever	4	8	3		2	3	1	1	22	.16	40	48	28	11	22	88	74	75	75	483	48.3
Continued Fever	1	12		3			1		17	.12	37	44	36	57	68	95	146	169	222	791	79.1
Whooping Cough	27	53	6	21	9	7	12	2	137	1.00	92	76	70	106	64	76	91	65	59	836	83.6
Diphtheria	117	161	40	80	17	14	2	4	435	3.18	584	370	317	359	348	345	481	264	333	3836	383.6
Membranous Croup	23	49	8	24	8	5	3	2	122	.89	133	186	171	203	151	164	155	181	178	1644	164.4
Mumps		1							1			4								5	.5
Other Miasmatic Diseases	1	2	1	3	2		1		10	.07	32	25	19				1			87	8.7

ORDER 2. DIARRHŒAL.																					
Cholera Infantum	127	217	56	135	38	33	30	24	660	4.82	506	753	727	....	....	....	....	696	526	3868	386.8
Infantile Diarrhœa	14	88	31	26	30	20	3	7	219	1.90	257	200	173	590	494	683	609	....	....	3225	322.5
Cholera Morbus	7	11	2	6	1	....	1	1	29	.21	36	36	28	28	30	....	....	....	....	187	18.7
Dysentery	19	23	14	13	6	16	5	2	98	.71	146	168	286	176	121	114	101	155	191	1556	155.6
Diarrhœa	17	29	11	10	6	3	5	3	84	.61	54	80	86	65	56	94	110	94	109	752	75.2
ORDER 3. MALARIAL.																					
Intermittent Fever	2	1	1	2	....	....	1	....	7	.05	21	32	23	9	15	22	38	12	37	216	21.6
Remittent Fever	4	3	1	6	....	2	....	....	16	.11	30	29	24	23	28	15	23	14	25	227	22.7
Pernicious or Congestive Fever	....	3	2	1	....	....	3	....	9	.06	17	17	18	13	8	28	30	46	30	216	21.6
Other Malarial Diseases	7	21	3	5	5	1	5	....	47	.33	49	56	57	....	78	14	20	33	43	397	39.7
ORDER 4. ZOOGENOUS.																					
Hydrophobia	1	....	....	....	....	....	....	....	1		1	....	1	....	....	1	....	....	1	5	.5
Glanders	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1	....	....	....	1	.1
Cow Pox and effects of Vaccination	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1	....	....	....	....	1	.1
Other Zoogenous Diseases	....	....	....	....	....	....	....	....	....	....	....	....	1	1	1	....	....	....	....	3	.3
ORDER 5. VENEREAL.																					
Syphilis	4	3	1	1	....	....	1	....	10	.07	4	12	10	14	12	15	10	11	16	114	11.4
Gonorrhœa, Stricture of Urethra	....	....	....	1	....	....	....	....	1	....	2	....	....	1	2	....	6	1	....	13	1.3
Other Venereal Diseases	....	....	....	....	....	....	....	....	....	....	1	....	....	....	....	....	....	....	....	....	....
ORDER 6. SEPTIC.																					
Phagedena	....	1	....	....	....	....	....	....	1	....	....	....	....	3	3	1	....	....	....	8	.8
Erysipelas	14	17	2	7	....	2	3	....	45	.32	22	45	45	73	60	37	62	49	62	500	50.0
Pyæmia. Septicæmia	6	6	6	8	7	2	2	2	39	.28	51	60	47	43	34	39	23	30	12	378	37.8
Puerperal Fever	5	20	1	12	4	3	1	4	50	.36	49	46	61	40	44	46	58	52	46	492	49.2
CLASS II.—Parasitic Diseases.																					
Thrush	....	....	....	....	....	....	....	....	....	....	1	6	1	....	1	3	2	1	3	18	1.8
Hydatids	....	....	....	....	....	....	....	....	....	....	....	1	....	1	1	1	....	3	1	8	.8
Worms	....	....	....	....	....	....	....	....	....	....	....	4	....	....	....	....	....	....	....	4	.4
Other Parasitic Diseases	....	....	....	....	....	....	....	....	....	....	....	1	....	....	....	....	....	....	....	1	.1

TABLE VII.—CONTINUED.

CAUSES OF DEATH.	Hartford Co.	New Haven Co.	New London Co.	Fairfield Co.	Windham Co.	Litchfield Co.	Middlesex Co.	Tolland Co.	1890, Total.	Per cent. to Total Mortality.	1889, Total.	1888, Total.	1887, Total.	1886, Total.	1885, Total.	1884, Total.	1883, Total.	1882, Total.	1881, Total.	Aggregate for Ten Years.	Average for Ten Years.
CLASS III.—Dietetic Diseases.																					
Starvation	1	1	...	...	...	...	...	...	2	.01	...	3	...	2	4	...	1	5	10	27	2.7
Intemperance	4	4	...	2	2	1	1	...	14	.10	25	18	10	42	34	33	...	...	...	176	17.6
Chronic Alcoholism	23	12	4	13	...	2	1	1	56	.40	23	16	31	...	...	...	39	47	49	261	26 1
Delirium Tremens	...	...	...	2	...	...	...	...	2	.01	9	8	6	17	9	8	...	...	...	59	5.9
Other Dietetic Diseases	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	1	.1
CLASS IV.—Constitutional Dis.																					
Rheumatism	23	36	12	18	3	7	5	5	109	.79	103	99	76	99	71	76	81	73	90	877	87.7
Gout	...	...	...	...	...	...	...	...	...	...	2	1	1	...	3	6	1	1	1	16	1.6
Rickets	...	...	...	...	...	...	...	...	...	...	5	5	1	3	1	1	...	...	...	16	1.6
Cancer of Breast	6	11	7	13	1	4	2	1	45	.32	38	34	38	...	...	...	...	...	...	155	15 5
Cancer of Stomach	11	28	5	9	3	3	4	2	65	.47	69	77	54	...	...	...	...	...	...	265	26.5
Cancer of Womb	14	10	2	7	1	1	2	1	38	.27	49	49	43	...	...	...	...	...	...	179	17.9
Cancer of other organs	64	38	28	38	19	10	10	6	213	1.55	168	188	181	280	288	312	305	248	269	2452	245.2
Tabes Mesenterica	7	16	8	8	1	5	13	5	63	.46	75	102	68	117	91	70	73	102	145	906	90.6
Tubercular Mening., Acute Hydro.	14	33	13	17	7	2	2	4	92	.67	81	75	88	89	56	38	53	52	...	624	62.4
Phthisis	297	488	168	282	89	84	90	46	1544	11.29	1459	1491	1428	1364	1422	1452	1517	1455	1404	14536	1453.6
Other forms of Tuberculosis	6	16	6	19	2	4	2	5	60	.43	59	53	72	4	9	1	...	...	...	258	25.8
Scrofula	3	5	3	7	5	4	2	2	31	.22	25	36	25	35	37	31	42	49	44	335	33.5
Pott's Disease	...	1	1	...	...	...	...	...	2	.01	3	3	3	1	4	...	...	...	...	16	1.6
Hip-Joint Disease	1	1	...	2	...	1	...	...	5	.03	2	4	2	9	8	...	...	...	...	30	3.0
Purpura	1	4	...	3	1	1	...	...	10	.07	3	4	6	5	2	4	4	2	2	42	4.2
Anæmia	7	11	3	3	3	1	2	1	31	.22	23	28	26	28	35	15	3	2	7	198	19.8
Diabetes	9	16	3	21	3	4	5	1	62	.45	48	49	50	42	45	41	39	42	21	439	43.9
Other Constitutional Diseases	...	3	...	1	...	...	1	...	5	.03	8	4	...	...	...	...	...	...	...	17	1.7

CLASS V.—Developmental Dis.																				
Premature Birth	32	70	21	40	15	11	8	3	200	1.46	217	190	274	156	163	207	437	356	297	2497	249.7
Atelectasis	2	4	...	2	...	8	...	...	11	.08	19	12	48	18	16	16	...	...	...	140	14.0
Cyanosis	9	4	2	5	...	...	...	...	20	.14	23	26	10	21	24	10	37	42	34	247	24.7
Spina Bifida	...	5	1	...	1	1	...	1	9	.06	10	8	8	10	7	6	6	6	10	80	8.0
Imperforate Anus	...	...	...	1	...	...	...	...	1	...	3	1	...	...	...	...	...	...	...	5	.5
Other Congenital Malformations	3	1	2	6	...	1	1	...	14	.10	15	11	19	15	23	9	32	13	20	171	17.1
Umbilical Hemorrhage	1	1	...	1	...	...	1	...	4	.02	9	6	8	11	4	7	3	...	...	52	5.2
Old Age	137	145	90	85	52	50	55	24	638	4.66	704	688	623	783	667	660	623	236	626	6648	664.8
CLASS VI.—Local Diseases.																				
ORDER 1. OF NERVOUS SYSTEM.																				
Inflam. of Brain or its Membranes	61	117	32	69	18	13	10	7	327	2.31	252	291	274	292	360	325	377	411	383	3292	329.2
Apoplexy	100	152	46	110	32	47	33	22	542	3.23	498	468	478	341	311	309	274	297	308	3826	382.6
Softening of Brain	19	18	12	21	9	8	4	...	91	.66	56	69	54	73	60	...	...	...	...	403	40.3
Hydrocephalus, not acute	2	6	5	1	1	2	6	2	25	.18	24	37	47	1	62	71	56	61	60	454	45.4
Hemiplegia	2	7	7	10	...	1	3	1	31	.22	32	25	28	...	209	202	175	189	190	1081	108.1
Paralysis Agitans	3	2	9	16	...	4	1	2	37	.27	40	65	85	...	...	...	...	...	...	227	22.7
Insanity	13	7	8	5	6	2	34	1	76	.55	47	73	52	37	59	40	71	55	58	568	56.8
Chorea	...	2	...	...	...	1	1	...	4	.02	4	...	3	4	1	...	2	1	3	22	2.2
Epilepsy	6	12	4	5	3	7	9	1	47	.33	39	34	43	36	25	42	43	39	38	386	38.6
Convulsions	55	94	26	59	10	9	15	13	281	2.06	287	267	251	279	300	285	284	263	258	2752	275.2
Trismus Nascentium	...	13	1	...	...	...	...	...	14	.10	9	13	6	5	14	6	...	...	...	67	6.7
Tetanus	1	6	2	6	...	...	2	...	17	.12	17	27	22	18	18	13	25	23	18	198	19.8
Paraplegia	3	4	1	1	1	...	...	...	10	.07	10	7	6	...	...	...	...	...	...	33	3.3
Diseases of Spinal Cord	2	1	3	4	3	2	1	...	16	.11	23	17	11	12	19	13	30	52	23	216	21.6
Myelitis	4	3	1	1	...	...	1	...	10	.07	16	12	4	6	2	...	...	...	...	50	5.0
Spinal Meningitis	7	3	6	6	6	2	1	2	33	.24	30	36	32	41	38	23	...	...	...	233	23.3
Locomotor Ataxia	...	2	1	2	...	2	...	...	7	.05	7	4	4	4	8	1	...	...	...	35	3.5
Other Diseases of Nervous System	49	65	40	39	16	24	31	7	271	1.98	218	221	199	285	305	234	300	302	257	2592	259.2

TABLE VII.—CONTINUED.

CAUSES OF DEATH.	Hartford Co.	New Haven Co.	New London Co.	Fairfield Co.	Windham Co.	Litchfield Co.	Middlesex Co.	Tolland Co.	1890, Total.	Per cent. to Total Mortality.	1889, Total.	1888, Total.	1887, Total.	1886, Total.	1885, Total.	1884, Total.	1883, Total.	1882, Total.	1881, Total.	Aggregate for Ten Years.	Average for Ten Years.
ORDER 2. OF ORGANS OF SPECIAL SENSE.																					
Epistaxis	....	....	....	....	....	....	....	....	....	....	....	....	1	1	2	1	....	1	1	7	.7
Otitis	....	1	....	1	....	....	1	....	3	.02	2	3	2	....	....	....	....	....	....	10	1.0
Other Diseases of Eye, Ear or Nose	1	....	....	1	....	....	....	....	2	.01	....	1	....	....	....	....	....	....	....	3	.3
ORDER 3. OF CIRCULATORY SYSTEM.																					
Endocarditis	7	15	4	15	1	4	....	9	55	.40	63	53	29	....	....	....	....	....	....	200	20.0
Valvular Disease of Heart	8	62	19	34	24	14	14	2	177	1.29	176	168	136	....	....	....	....	....	....	657	65.7
Disease of Heart	147	101	43	85	21	8	35	26	466	3.41	403	463	477	640	635	557	591	545	492	5269	526.9
Pericarditis	8	3	1	9	3	5	1	....	30	.21	20	25	26	13	24	21	2	21	25	207	20.7
Hypertrophy of Heart	16	9	12	8	3	18	4	....	70	.51	34	48	34	....	....	....	....	....	....	186	18.6
Angina Pectoris	2	10	26	6	5	3	5	2	59	.43	68	70	37	36	20	21	....	26	....	337	33.7
Syncope	....	....	7	5	1	1	....	....	14	.10	9	16	6	....	1	....	....	....	....	46	4.6
Aneurism	2	2	3	3	1	1	....	....	12	.08	5	8	11	13	4	8	5	6	8	80	8.0
Senile Gangrene	1	2	4	2	2	1	1	2	15	.10	28	17	15	27	30	27	31	37	44	271	27.1
Thrombosis, Embolism	16	4	8	1	13	12	7	2	63	.46	41	44	39	14	11	10	5	8	12	247	24.7
Phlebitis	1	....	....	....	....	....	....	....	1	....	4	1	1	1	2	1	....	2	1	14	1.4
Other Diseases of Circulatory System	21	12	4	36	9	15	21	8	126	.92	77	68	64	....	1	....	....	....	....	336	33.6

ORDER 4. OF RESPIRATORY SYSTEM.																					
Laryngitis	4	4		7		2			17	.12	23	23	24	17	15	11	16	12	20	178	17.8
Catarrhal Croup			1						1		6	3	2							12	1.2
Other Diseases of Larynx or Trachea						2	3		5	.03	3	3	2							13	1.3
Emphysema, Asthma	8	4	4	7	2		1	1	27	.19	32	44	37	24	24	31	16	28	31	294	29.4
Bronchitis	100	156	34	103	19	21	17	5	455	3.32	324	365	229	197	245	204	207	197	168	2591	259.1
Pneumonia	328	458	119	264	81	83	62	35	1430	10.46	915	1107	963	837	1025	694	891	804	713	9379	937.9
Pleurisy	4	10	3	10		2	1	1	31	.22	38	27	28	16	24	17	23	23	16	253	25.3
Other Dis. of Respiratory System	7	9	2	3	3	3	2		29	.21	38	48	42	34	33	48	49	93	82	496	49.6
ORDER 5. OF DIGESTIVE SYSTEM.																					
Stomatitis	1	3	1	1		1			7	.05	3	10	6			1				27	2.7
Dentition	2	11	5	8	1	1	2		30	.21	45	29	28	35	26	37	46	29	37	342	34.2
Quinsy		1	1	7		1			10	.07	5	7	4	2	3		1		8	40	4.0
Dyspepsia	3	5	7	3		2	3	2	25	.18	13	20	17	5	11	13				104	10.4
Hæmatemesis				1		1	1	2	5	.03	12	8	8	24	27					84	8.4
Disease of Stomach	16	38	12	40	13	6	8	3	136	.99	86	100	84	101	98	109	149	115	95	1073	107.3
Ulcer of Stomach	2	7	2	9	1	1			22	.16	22	12	17	11	8	14				106	10.6
Enteritis	23	40	25	23	10	4	4	2	131	.95	112	91	98	91	96	97	72	56	37	881	88.1
Ulceration of Intestines		4		5					9	.06	9	16	18	9	7	23	12	14	15	132	13.2
Obstruction of Intestines	5	8	2	8	1	2	4	1	31	.22	25	25	22	20	15	12				150	15.0
Strangulation of Intestines		3	1			1			5	.03	1	1	1							8	.8
Intussusception of Intestines	1	4	1	1					7	.05	7	10	5		4	11	26	21	14	105	10.5
Hernia	1	11	1	6	1	1	1		22	.16	23	29	23	18	20	22	22	20	13	212	21.2
Fistula		1		1					2	.01	1	2		5			4	1	3	18	1.8
Peritonitis (not puerperal)	25	31	12	26	7	10	6	3	120	.87	122	115	104	127	121	78	121	119	161	1188	188.8
Ascites		5	2	2	1		1		11	.08	7	5	12	8	5	6	8	11	5	78	7.8
Gallstones			1	1	2				4	.02	2	5	5	10	2					28	2.8
Cirrhosis of Liver	10	12	6	13	2	2	2	1	48	.35	63	45	44	40	27	43				312	31.2
Other Diseases of Liver	17	6	9	13	3	3		1	52	.38	40	50	63	66	62	55	85	85	98	656	65.6
Hepatitis	8	12	1	9	1	1	1	1	34	.24	29	24	38	30	20	25	24	13	17	254	25.4
Jaundice	3	2	5	4	2		1		17	.12	15	16	13	17	19	27	13	20	21	178	17.8
Other Diseases of Digestive System	1	6		6	2	4	2		21	.15	20	32	24	20	20	23	14	23	11	208	20.8

TABLE VII.—CONTINUED.

CAUSES OF DEATH.	Hartford Co.	New Haven Co.	New London Co.	Fairfield Co.	Windham Co.	Litchfield Co.	Middlesex Co.	Tolland Co.	1890, Total.	Per Cent. for Total Mortality.	1889, Total.	1888, Total.	1887, Total.	1886, Total.	1885, Total.	1884, Total.	1883, Total.	1882, Total.	1881, Total.	Aggregate for Ten Years	Average for Ten Years.
ORDER 6. OF LYMPHATIC SYSTEM AND DUCTLESS GLANDS.																					
Addison's Disease	...	...	...	...	...	...	...	...	...	...	6	...	2	1	1	..	1	1	1	13	1.3
Disease of Spleen	...	...	...	...	...	...	...	...	...	...	...	1	1	4	2	...	1	2	2	13	1.3
Bronchocele	...	...	...	...	...	1	...	...	1	...	...	2	...	2	..	1	...	...	...	6	.6
Diseases of Lymphatic System	...	...	...	...	...	...	...	...	...	...	2	2	3	...	...	...	...	...	...	7	.7
ORDER 7. OF URINARY SYSTEM.																					
Nephritis	13	30	6	17	...	4	4	2	76	.55	79	90	76	50	61	37	30	32	19	450	45.0
Bright's Disease	74	57	35	59	21	24	14	10	294	2.15	281	269	248	223	191	206	193	141	149	2195	219.5
Uræmia	6	10	3	12	2	4	2	...	39	.28	34	34	25	25	31	27	29	26	17	287	28.7
Suppression of Urine	...	1	...	...	...	...	...	...	1	...	3	5	2	...	...	...	...	...	...	11	1.1
Calculus	...	2	...	2	...	...	...	...	4	.02	3	2	2	7	2	8	5	7	6	46	4.6
Hæmaturia	3	2	1	3	...	3	...	...	12	.08	6	2	2	4	1	...	...	...	...	27	2.7
Disease of Bladder	14	14	7	9	3	5	2	1	55	.40	40	38	42	26	42	43	39	29	23	377	37.7
Prostatitis	...	2	...	3	...	2	1	...	8	.05	14	8	11	8	1	3	...	...	...	53	5.3
Other Diseases of Urinary System	1	3	4	4	1	5	...	...	18	.13	10	20	23	37	42	30	19	33	32	264	26.4

ORDER 8. OF GENERATIVE SYSTEM.																					
A. *Of Reproductive Organs.*																					
Diseases of the Uterus	2	2	1	2		1	3	1	12	.08	9	9	11	24	10	16	5	28	10	134	13.4
Metritis		2							2	.01	6	3	2	4	4	1				22	2.2
Disease of Ovaries	1	6			3	2			12	.08	17	15	9	13	12	15	17	23	16	149	14.9
Disorders of Menstruation											1	1			1					3	.3
Menorrhagia											1		1		1					3	3
Pelvic Abscess						1			1			8	1							10	1.0
Perineal Abscess					1				1		2									3	.3
Dis. of Testis, Penis, Scrotum, etc.														2						2	.2
B. *Of Parturition.*																					
Abortion and Miscarriage	2	1		2			1		6	.04	7	5	15	9	8		6			56	5.6
Puerperal Mania	1				1	1	2		5	.03	2	2	5	2	3	4				23	2.3
Puerperal Convulsions	4	3	1	1	1				10	.07	16	9	15	17	23	17				107	10.7
Puerperal Hemorrhage		1		1		1	2		5	.03	7	6	1	18	12	8				57	5.7
Placenta Previa	1	2							3	.02	2	3	1	4	2					15	1.5
Phlegmasia Dolens												3								3	.3
Other Accidents of Childbirth	12	12	4	8	4	4	5	1	50	.36	35	39	55	35	37	32	29	71	71	454	45.4
ORDER 9. OF ORG. OF LOCOMOTION.																					
Caries, Necrosis		2		2	1	2			7	.05	9	4	3	3		4	5	16	1	52	5.2
Arthritis, Periostitis	2	1							3	.02	4	4	6			1			4	22	2.2
Other Dis. of Organs of Locomotion				1					1		1	3	1		5	5	13	1	9	39	3.9
ORDER 10. OF INTEGUMENTARY SYSTEM.																					
Bedsores											1									1	.1
Carbuncles		1	2				1		4	.02				4	8		2	8	5	31	3.1
Other Dis. of Integumentary System		5	1	2	2				10	.07	14	14	9	13	13	2	5	19	10	109	10.9

TABLE VII.—CONTINUED.

CAUSES OF DEATH.	Hartford Co.	New Haven Co.	New London Co.	Fairfield Co.	Windham Co.	Litchfield Co.	Middlesex Co.	Tolland Co.	1890, Total.	Per cent. to Total Mortality.	1889, Total.	1888, Total.	1887, Total.	1886, Total.	1885, Total.	1884, Total.	1883, Total.	1882, Total.	1881, Total.	Aggregate for Ten Years.	Average for Ten Years.
CLASS VII.—Violence.																					
ORDER 1. ACCIDENT OR NEGLIGENCE.																					
Fractures and Contusions	12	8	2	7	...	1	5	1	36	.26	46	51	60	38	63	61	77	105	62	599	59.9
Fractures and Contusions of Skull	12	5	3	3	4	...	2	...	29	.21	20	30	13	...	...	..	...	...	...	92	9.2
Railroad Injuries	36	48	14	29	7	9	3	...	146	1.06	134	104	99	97	104	68	121	82	39	998	99.8
Gun-shot Wound	1	1	1	1	...	...	...	...	4	.02	12	13	9	2	4	...	...	...	...	44	4.4
Burns and Scalds	3	15	5	9	...	3	3	...	38	.27	30	34	32	44	50	35	35	38	43	379	37.9
Poisoned	2	8	...	3	...	...	2	...	15	.10	12	14	14	17	19	24	18	13	21	167	16.7
Arsenic	...	...	...	...	...	...	...	...	...	...	1	2	...	...	...	...	...	...	...	3	.3
Drowning	10	19	8	14	3	8	8	1	71	.51	89	87	84	78	85	61	79	74	51	759	75.9
Suffocation	1	9	...	1	1	1	...	1	14	.10	17	12	15	17	14	10	10	12	16	137	13.7
Other Accidents	15	14	3	13	4	5	2	...	56	.40	82	52	49	66	59	68	75	49	42	598	59.8
Falling	4	19	3	16	1	4	4	1	52	.38	47	45	45	34	28	...	...	...	..	251	25.1
ORDER 2. HOMICIDE.																					
Murder	2	1	...	1	...	1	...	...	5	03	2	9	9	6	2	2	...	...	...	35	3.5
Manslaughter	...	...	...	...	...	1	...	...	1	....	5	1	2	4	1	10	9	9	2	44	4.4

ORDER 3. SUICIDE.																					
Gun-shot Wounds	3	6	1	4	2	1	...	...	17	.12	13	10	18	84	6	...	...	...	...	148	14.8
Cut, Stab	4	1	1	2	1	3	...	...	12	.08	4	11	6	3	10	...	...	...	...	46	4.6
Poisoned	1	4	1	2	...	...	...	...	8	.05	17	20	16	18	26	...	...	...	...	105	10.5
By Opium	1	4	...	1	...	...	...	...	6	.04	8	8	8	...	...	...	...	...	...	30	3.0
Drowning	3	11	4	3	...	2	3	1	27	.19	20	19	28	11	17	...	...	...	...	122	12.2
Hanging	4	3	2	5	1	...	1	...	16	.11	16	23	14	17	9	...	...	...	...	95	9.5
Otherwise	2	4	...	1	...	...	...	...	7	.05	4	5	5	9	5	...	...	...	...	35	3.5
ORDER 4. EXECUTION.																					
Hanging	...	...	...	...	...	...	...	...	...	...	1	1	...	...	...	...	...	...	...	2	.2
CLASS VIII.—Unclassified.																					
Tumor	10	8	1	8	...	1	3	...	31	.22	19	37	24	...	5	11	17	16	24	184	18.4
Dropsy	7	12	17	11	8	6	7	6	74	.51	83	81	101	...	120	106	146	162	142	1015	101.5
Debility, Atrophy, Inanition	83	84	62	61	5	9	8	6	318	2.32	302	296	330	160	222	110	140	119	154	2151	215.1
Sunstroke	3	4	...	3	...	...	2	...	12	.08	3	8	29	5	7	4	1	2	3	74	7.4
Exhaustion	5	12	5	8	3	5	2	1	41	.30	89	87	71	...	5	...	...	...	...	293	29.3
Hemorrhage	6	6	3	14	4	2	2	4	41	.30	32	43	25	...	...	...	...	...	...	141	14.1
Abscess	5	6	1	6	4	1	...	...	23	.16	25	21	16	...	27	31	38	34	33	248	24.8
Sudden Deaths	1	1	3	2	...	...	3	...	10	.07	15	9	18	...	...	...	...	...	...	52	5.2
Surgical Operation	2	...	...	2	...	...	...	...	4	.02	...	...	...	...	...	...	...	...	...	4	.4
Other ill-defined causes	28	30	17	46	32	23	11	11	198	1.44	253	151	186	436	239	269	5	5	2	1744	174.4
Cause not stated	12	4	2	5	3	1	5	1	33	.24	57	90	197	305	437	342	343	386	409	2598	259.8

TABLE VIII.

DEATHS IN TOWNS, ALPHABETICAL ARRANGEMENT, DISTINGUISHED BY AGE AND MONTH.

TOWNS.	AGES.																													
	Under 1 year.	1 to 5.	5 to 10.	10 to 20.	20 to 30.	30 to 40.	40 to 50.	50 to 60.	60 to 70.	70 to 80.	80 to 90.	90 to 100.	Over 100.	Unknown.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Males.	Females.	Total Deaths.	Total Births.	Sex not stated.
Andover	1						1			4		1				1	1	2				1		1		1	5	2	7	5	
Ansonia	63	40	13	15	20	13	21	11	10	10	14	1			28	11	8	20	26	14	34	28	12	14	17	19	112	119	231	342	
Ashford		1				1			2	4	6	1			2	1	4	1		2	3			1	1		11	4	15	13	
Avon	3	3	1		1	1	2	1		1	3				2		2	2	3	1	1	1		1		3	4	12	16	21	
Barkhamsted	1	3		1	1	1	1	2	6	2	6	2			6	5	3	2	1		2	2	1		3	1	9	17	26	18	
Beacon Falls									1						1													1	1	10	
Berlin	6	1	4	1	4	3	2	1	8	7	4	1			4	3	4	8	7	3	4	6		5	2	1	21	21	42	34	
Bethany	1	1		1						3	2	1			2	1		1			2	1	1	1			5	4	9	4	
Bethel	13	2		2	5	2	6	5	6	8	2	1			7	5	3	4	4	3	4	2	1	2	9	8	24	28	52	87	
Bethlehem		1					2		2	3	1				1			1		1	2		1	2		1	5	4	9	14	
Bloomfield	3	1		2	3	2		2		4	4				2		3	3			5		1	3	2	2	12	9	21	20	
Bolton	1		1						1		1								1	2			1				3	1	4	5	
Bozrah	1	1			1		3	3	2	5		1			7		1	1	2			1	2	1	1	1	8	9	17	17	
Branford	16	15	4		3	8	11	6	5	8	6				8	3	8	4	5	3	5	18	6	12	3	12	44	38	82	118	
Bridgeport	202	119	33	34	80	78	81	97	92	63	27	5		3	114	76	76	84	63	65	100	79	70	66	64	57	489	425	914	1486	
Bridgewater					1				5	4	3				2	2	2		2	1		1	1	1		1	8	5	13	8	
Bristol	28	10	4	3	16	18	15	6	9	14	7	3			23	12	8	7	13	10	8	13	10	12	13	4	62	71	133	156	
Brookfield	2		1	2	1			4	4	6	3	2			5	2	3	2		1	1	1	3	1	3	4	13	13	26	24	
Brooklyn	13	5	4	4	1	4	2	1	3	7	2	1			5	5	2	5	8	1	3	7	2	8	3	3	25	22	47	52	
Burlington	4	5	1	2	3	2	5	1	4	6	1				3		4	6	3	1	4	4	2	3	2	2	18	16	34	45	
Canaan	1	1	1		3	1	1	2	1	2	6				3	2	3		1	1	2	2	1	1	2	1	7	12	19	14	
Canterbury	3	1		1		2	1	1	2	8	4	1			1	3	1	3	2	1		2	1	2	6	2	15	9	24	11	
Canton	4	1	1	3	3	5	4	8	5	10	7	1			6	8	2	8	3	4	4	4	6	8	8	6	29	23	52	53	
Chaplin								2		5	2						2		1	1		2	1			2	5	4	9	4	
Chatham	4			4	2	3	3	3	9	6	5	1			3	5	3	2	2		1	7	1	8	5	3	17	23	40	31	
Cheshire	1	1		2		5	2	3	2	9	2	3	1		8	3	3	4	1	2	1	2	8	2	3	4	16	15	31	18	
Chester	1	1		2	1	3	2	2	3	4	3	1			5	4	1	1	8	3	2	1		1		2	14	9	23	17	
Clinton	1	1	1		2	1	3	2	8	8	4				2	2	2	3	2	3	2	4		6	2	3	20	11	31	14	
Colchester	8	4		2	8	3	4	5	4	12	6	2			8	7	6	5	7	5	5	2	3	2	5	3	29	29	58	67	
Colebrook	1	2	1	1	1				1	1	4				2		1		2		2	2	1	1		1	7	5	12	18	
Columbia	1		1	1	1	2	2	1	3	5	3	1			3	1	5	2	1	3	1	2		1	2		10	11	21	15	
Cornwall	1			1	1	3	1	1	3	3	3	3				1	1	2	3	1	2	1	1	5	2	1	10	10	20	15	
Coventry	5	3	1		4	2	3	2	5	3	6	1			3	4	3	5	2	2	6	3			2	5	18	17	35	29	
Cromwell	10	2	1	4	2	4	5	8	8	1	3				3	6	2	7	2	4	1	7	1	6	6	3	30	18	48	48	
Danbury	72	21	10	12	29	26	22	31	25	26	10	2			34	24	29	17	12	21	30	32	24	23	21	19	156	130	286	510	
Darien	3	2	1	1	1	1	7	7	15	7	8	2			2	4	2	11	1	4	4	5	5	5	7	5	37	18	55	20	
Derby	35	4	3	7	11	8	8	10	8	9	4	1		4	12	5	7	4	7	11	16	14	6	7	7	11	57	49	107	164	1
Durham	4				1	1		2	2		3				1			1	2	2	1	4		1	1		7	6	13	12	

Eastford	1				2		2		1	1	3	1				2	3					2	2	2			6	5	11	8	
Easton	1			1				2	4	1	7	2			3	1	2	1		3	1	2		3	1	1	7	11	18	19	
East Granby	2						2	1	2	3	2				2	1	1	3					1	2	2		7	5	12	13	
East Haddam	4	3	1	5	2	2	2	2	8	10	8	2			2	4	8	5	4	5	3	4	4	5	5		18	31	49	44	
East Hartford	10	7	1	1	6	8	3	7	10	6	7	1			10	8	5	4	7	2	5	7	5	1	8	5	33	34	67	94	
East Haven	2	2			2	1			2	2	1	2			1					1	3	2		3	1	3	6	8	14	10	
East Lyme	5	2		2	2	3	3	3	6	5	2	1		2	3	3	4	7	2	1	4	1	3	4	2	2	23	13	36	35	
East Windsor	5	4	1	3	3	3	1	2	3	5	5	1			3	5	3	3	1	3	4	7	1	2	1	3	21	15	36	53	
Ellington	3	2		1	2		3	4	5	4	4	1			3	1		2	4	1	4	2	4	2	3	3	14	15	29	23	
Enfield	29	7	4	6	19	3	8	16	15	15	11	4			25	6	9	3	10	11	12	16	12	7	12	14	74	63	137	163	
Essex	5	3			1	2	2	6	2	10	6				3	1	2	2	4	2	3	1	7	5	5	2	17	20	37	35	
Fairfield	13	4		3	5	3	4	4	6	9	4	2			5	7	3	3	7	4	5	8	6	3	3	3	27	30	57	57	
Farmington	9	3	3		2	2	3	4	5	2	4	2			3	4	7	5	4	3	1	4	4	2	1	1	20	19	39	46	
Franklin						1		1		1	3									1	2	1				2	5	1	6	6	
Glastonbury	9	10	2	2	6	2	6	6	11	10	2	2	1		10	7	6	8	5	10	4	4	6	5	1	3	30	39	69	64	
Goshen	1	1			2	2	1	2	1	1	2	4			2	3	2	1		1		1	1	1	2	3	7	10	17	19	
Granby	1	1			1	2		1	4	6	1	1			2	2	1	1	2		1	1	3	2	2	1	6	12	18	20	
Greenwich	20	15	4	13	16	12	11	3	21	19	11	1			17	11	15	13	11	15	11	14	10	14	8	7	74	72	146	178	
Griswold	18	12	2	1	3	6	1	6	9	8	5				9	6	5	5	5	7	3	6	7	5	3	10	42	29	71	59	
Groton	20	6	1	1	2	5	6	7	9	21	17				11	4	10	8	14	11	6	10	1	12	5	3	51	44	95	106	
Guilford	8	4		3	3	1	1	3	11	8	9	3			7	4	4	4	5	3	4	8	5	4	3	3	26	28	54	57	
Haddam	4	1	1		1	2	3	4	8	16	7				4	1	3	2	4	4	4	7	5	8	3	2	27	20	47	35	
Hamden	20	5		2	5	6	6	4	6	10	9	1			6	14	8	8	5	5	5	6	5	6	4	2	45	29	74	60	
Hampton	1		1			1	1	1	2	1	1					1	3	1	1		3						6	3	9	10	
Hartford	189	94	47	36	121	120	93	146	114	100	63	15			178	101	94	90	85	82	105	82	75	79	82	85	593	545	1138	1230	
Hartland	1			1		1	1		1	3					2	2		1		1	1					1	6	2	8	4	
Harwinton	2		1	2			1	1		4	2				2		2		3	1				3		2	4	9	13	19	
Hebron	2			1						9	3				2	2	1	1		2	2	1	2		2		8	7	15	20	
Huntington	4	9	4	3	9	5	8	2	5	13	2				6	8	3	5	8	5	6	8	9	5	4	2	29	35	64	76	
Kent	5	3		1	2					5	4	1		2	1	5		1	1	3	2	2	2		2	4	11	12	23	28	
Killingly	31	20	5	3	8	12	5	6	23	16	16	1			15	17	5	14	9	8	6	25	12	9	18	8	53	93	146	179	
Killingworth		1						1	4	4	2	1			2	3		1		2		1		2	2		6	7	13	9	
Lebanon	3	1		4	3			4	3	6	6	1			6	3		4	4	1	2	2	3	1	2	3	14	17	31	24	
Ledyard				3	2	5		1	1	2	1	1			1	1	2		2	1	2	3		2	1	1	11	5	16	10	
Lisbon	3							1	4	5	2				1		1	6		1		2	2		1	1	7	8	15	8	
Litchfield	5	1		2	2	1	7	4	8	9	10	1			5	4	8	5	4	1	2	5	1	3	6	6	19	31	50	49	
Lyme	3			1		3	2	2	2	7		1				1	2	4	2	2	2	1	2	2	3		7	14	21	15	
Madison	2	2		3	1		1	4	6	8	2				3		3		3	2	2	4	3	3	3	3	19	10	29	21	
Manchester	37	7	6	11	19	11	13	11	18	11	7			2	22	10	11	13	12	12	14	14	14	16	9	6	72	81	153	202	
Mansfield	1	3		1	2	1	1	1	3	6	6	2			5		3	3	3	2	1	2		4	2	2	9	18	27	21	
Marlborough	1			1	1	1	2	1	3	1					3		1		1	1	1	1	1	1	1		5	6	11	10	
Meriden	90	55	13	27	50	30	33	27	31	27	10	2	1	2	45	29	46	32	30	30	32	39	24	34	31	26	203	195	398	710	
Middlebury	1		3	2	1	1		1	4	4	4				4	3		2	2	4	1	2		1	2		10	11	21	9	
Middlefield					2			2	3	2	2				2		2	1	1	1			1	1	1	1	5	6	11	13	
Middletown	47	10	3	16	33	37	39	40	42	34	21	10			27	29	21	26	36	16	45	43	24	31	19	15	168	163	332	314	1
Milford	8		2	9	3	9	4	1	8	8	8				5	1	6	4		6	12	9	4	4	5	4	32	28	60	55	
Monroe	2	1		1	2	1	1	3	2	5	4	2			1		2	3	2	2	4	2	3	4	1		11	13	24	10	
Montville	1	4	1	4	4	2	3	6	5	9	6	3			13	3		4	4	6	1	5	5	4	2	1	28	20	48	46	

TABLE VIII.—Continued.

TOWNS.	AGES.																													
	Under 1 year.	1 to 5.	5 to 10.	10 to 20.	20 to 30.	30 to 40.	40 to 50.	50 to 60.	60 to 70.	70 to 80.	80 to 90.	90 to 100.	Over 100.	Unknown.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Males.	Females.	Total Deaths.	Total Births.	Sex not stated.
Morris	1	....	....	....	....	....	....	....	1	1	1	....	..	..	....	2	....	....	....	1	....	1	....	....	....	....	3	1	4	10	1
Naugatuck	26	9	2	13	13	9	14	14	5	9	3	1		..	23	10	9	6	6	4	6	13	10	5	13	13	59	59	118	172	..
New Britain	69	35	13	22	29	22	28	30	31	12	5	3	..	..	48	19	23	20	36	13	30	24	24	23	23	16	158	141	299	560	..
New Canaan	4	4	1	2	4	2	2	2	10	14	4	....	..	..	2	4	7	5	3	3	3	5	4	4	2	7	29	20	49	60	..
New Fairfield	2		....	....	....	....	1	....	....	2	3	....	..	..	3	....	....	....	....	2	1	....	1	1	....	....	2	6	8	17	..
New Hartford	12	4	4	3	6	4	3	5	10	10	8	1	1	..	17	12	4	4	3	2	11	4	5	4	2	3	29	42	71	71	..
New Haven	340	165	75	95	168	160	171	164	188	109	79	17	..	12	223	136	148	136	121	134	212	146	109	123	107	148	895	848	1743	2433	..
Newington	2	....	....	....	1	....	2	1	....	3	1	....	..	..	1	1	1	1	....	....	....	1	....	1	1	3	6	4	10	8	..
New London	48	26	3	11	28	20	15	19	38	34	24	1	1	..	41	13	26	22	17	14	21	33	22	21	22	16	140	128	268	340	..
New Milford	10	7	....	1	5	3	7	3	7	6	9	3	..	..	6	6	5	8	2	7	11	6	3	....	2	5	30	31	61	86	..
Newtown	7	2	2	3	3	7	3	4	9	12	9	4	..	..	8	6	12	5	5	4	4	6	3	4	4	4	32	33	65	47	..
Norfolk	6	1	2	3	4	4	3	....	3	4	1	1	..	..	3	1	5	3	4	4	....	1	5	2	3	1	17	13	32	16	2
North Branford	....	....	....	2	....	2	....	....	3	....	1	1	..	..	3	1	....	1	1	2	....	....	....	1	....	....	4	5	9	13	..
North Canaan	6	....	....	1	4	....	....	1	3	3	5	....	..	..	2	4	1	4	1	1	....	2	2	3	....	3	12	11	23	27	..
North Haven	6	1	....	1	2	....	....	1	7	5	3	1	..	1	3	2	....	2	2	2	3	4	3	1	3	3	14	14	28	21	..
No. Stonington	2	1	....	1	2	1	2	3	4	4	6	1	..	1	5	3	1	1	3	2	3	2	1	5	2	....	12	16	28	20	..
Norwalk	55	15	8	9	36	35	21	35	39	36	24	4	..	..	38	19	23	33	23	18	20	36	31	17	31	28	161	155	317	423	1
Norwich	99	42	18	24	38	32	27	31	35	51	30	8	1	..	47	32	45	26	18	21	53	47	48	37	26	36	223	213	436	549	..
Old Lyme	3	....	2	2	3	2	1	2	3	4	4	2	..	..	4	2	1	3	3	1	3	2	....	6	1	2	14	14	28	27	..
Old Saybrook	5	....	....	....	3	2	1	4	5	6	....	....	..	..	2	....	1	3	4	3	2	3	3	2	....	3	15	11	26	34	..
Orange	20	3	3	4	10	5	2	4	6	12	6	2	..	..	14	10	7	6	8	2	9	6	4	4	2	5	37	40	77	70	..
Oxford	5	1	....	....	....	....	....	2	3	2	3	1	..	..	1	1	1	4	1	3	2	....	1	1	2	....	9	8	17	22	..
Plainfield	18	5	3	6	4	5	5	8	7	16	4	2	..	2	6	8	5	10	6	5	8	10	6	6	8	7	34	51	85	101	..
Plainville	1	3	1	1	....	4	3	2	7	3	4	2	..	..	3	....	3	4	4	3	1	2	1	3	3	4	20	11	31	28	..
Plymouth	4	6	1	1	2	5	1	1	2	4	2	....	..	..	4	4	1	....	5	....	1	3	2	4	....	5	16	13	29	44	..
Pomfret	3	1	....	1	1	6	3	2	6	5	2	1	..	1	5	1	2	8	2	4	....	....	3	1	2	4	15	17	32	40	..
Portland	25	17	2	4	8	5	3	5	9	12	5	3	..	..	14	8	7	8	10	12	13	14	4	3	2	3	48	50	98	174	..
Preston	6	4	2	1	4	2	....	3	2	4	4	1	..	..	4	5	2	4	4	2	4	2	3	1	2	....	20	13	33	31	..
Prospect	1	2	....	....	2	....	....	....	....	4	3	....	..	..	3	2	1	1	1	....	1	1	....	....	1	1	7	5	12	5	..
Putnam	37	11	4	5	11	6	4	6	9	14	3	2	..	1	6	9	12	3	14	15	14	12	14	6	3	5	66	47	113	202	..
Redding	1	5	....	1	2	2	....	2	3	8	2	2	1	..	2	4	1	2	1	2	3	3	3	3	3	2	17	12	29	35	..
Ridgefield	4	5	....	....	2	2	3	6	8	10	3	1	..	1	3	1	2	4	5	4	5	6	7	2	2	4	21	23	45	55	1
Rocky Hill	5	....	1	....	2	2	2	2	9	7	....	1	..	..	3	2	1	6	4	....	1	....	4	3	2	5	13	18	31	25	..
Roxbury	3	1	....	1	....	2	1	2	3	7	2	2	1	..	1	3	4	3	1	1	2	1	4	2	2	1	16	9	25	23	..
Salem	....	....	....	1	....	1	1	1	2	3	....	....	..	..	1	....	1	1	1	....	....	2	1	2	....	....	4	5	9	10	..
Salisbury	4	5	1	5	10	6	7	3	4	10	6	2	..	..	4	14	14	4	3	2	3	4	4	5	4	2	33	30	63	71	..
Saybrook	5	2	....	....	....	....	1	2	1	2	6	1	..	..	2	....	4	1	2	....	2	4	1	2	....	2	10	10	20	13	..

Scotland								1	2	2	3				3	1				1	1			1		1	5	3	8	9	
Seymour	13	8	2	2	6	7	6	2	4	4	2	1			8	4	5	7	5	3	7	5	6	2	3	2	22	35	57	71	
Sharon		4		6	3	1	2	5	6	4	5	2			4	5	4	1	2	1	2	3	5	2	5	4	20	18	38	43	
Sherman	1	1			1	2	1	1	1	1	5				1	3	1			1	1	1	1	1	4		6	8	14	13	
Simsbury	3		1		4	2	5	5	5	4	1	1			3	2	2	5	1	3	3	4	3	3	1	1	19	12	31	46	
Somers	1		3	1	4	1		1	2	1	3				1		2	2	2		2	3	1	2	2		10	7	17	16	
Southbury		1			3	1	1	1	4	8	3	1			3	1	2	1			1	1	4	7	2	1	10	13	23	21	
Southington	14	10	4	2	8	5	7	13	10	6	12	3			9	7	9	9	8	4	7	12	5	8	11	5	53	41	94	95	
South Windsor	5			1	2	1	2	3	2	3	3				2	1	1	2	2	3	1	2	3		3	2	10	12	22	17	
Sprague	6	4	1	3	2	2		1	3	3		1			4	2	5	6	1		4		1	1	1	1	9	17	26	13	
Stafford	13	5	2	3	7	4	4	4	5	15	4	4			4	3	7	7	4	5	6	5	13	4	6	6	40	30	70	117	
Stamford	69	21	7	13	20	19	21	21	27	27	17	5			26	28	18	27	23	16	32	27	18	8	21	23	126	141	267	413	
Sterling	4			1	2		2	2	4	8	2					5	3	2			1	3	3	5	2	1	11	14	25	13	
Stonington	11	15	5	3	9	10	8	13	18	17	10	2			14	7	13	9	17	10	10	18	10	8	7	8	72	59	131	136	
Stratford	3	1		5	5	3	7	3	9	7	3				6	6	4	4	3	2	6	2	5	2	3	3	24	22	46	46	
Suffield	8			1	3	6	5	5	7	7	7	2			10	4	2	5	3	1	5	6	5	5	1	4	27	24	51	51	
Thompson	24	6	3	6	3	10	2	7	8	11	3	3			9	7	4	9	6	7	6	10	8	7	7	6	45	41	86	112	
Thomaston	11	6	1	3	4	8	2	4	2	2					7	3	2	5	2	3	3	13	1	2	2		25	18	43	93	
Tolland						1		1	3	4	3	1			2	2	3		2	2					1	1	7	6	13	15	
Torrington	25		2	9	7	3	7	6	7	8	4			3	10	5	1	2	4	8	7	15	7	7	5	10	39	41	81	127	1
Trumbull	5		1	1	2		2		3	5	5	2			4	3	2		3		3	2	2	2	1	4	12	14	26	18	
Union		1						1		1	1							2					1			1	3	1	4	7	
Vernon	32	7	3	6	16	11	11	7	14	14	8	3			14	12	14	17	12	4	9	13	10	9	4	14	57	75	132	234	
Voluntown	4	3		1	2	1	4	1	1	4	2	1			2	2	1		1	1	3	3	5	3	1	2	11	13	24	21	
Wallingford	22	11	5	5	6	8	6	8	14	14	3	1			12	8	10	7	3	6	16	19	8	6	3	5	57	46	103	175	
Warren	1	1					1	1		1	1				1	1	1			1		1				1	4	2	6	6	
Washington	2	1			3	1	3	2	5	4	5				4	1	2	2		3		2	4	1	6	1	18	13	26	29	
Waterbury	155	60	18	28	89	59	49	40	67	38	18	4		1	80	46	45	51	31	45	86	50	50	61	41	40	347	279	626	976	
Waterford	8	4	1	3	6	4	3	2	6	5	4	1			5	1	1	6	2	3	4	7	4	7	3	4	23	24	47	27	
Watertown	2		1	2	5	1	1	1	8	4	5				1	2	1	3	2	1	6	2	4	2	3	3	14	16	30	53	
Westbrook	2	1	1	1	2		2	2	2	1	3				2	1	1	1	1	1	3	3		2		2	11	6	17	9	
West Hartford	7	2		1	1	2	4	3	6	2	4				5	7		2	1	2	4	3	1	2	3	2	14	18	32	20	
Weston		3		2			3	1	3		2						2	3				4	1	1	1	2	13	1	14	10	
Westport	9	6		5	1	6	5	6	6	13	8	6	1		8	4	4	7	5	4	4	9	7	5	8	7	28	44	72	62	
Wethersfield	3		1	1	12	3	1		7	3	6	1			2	3	4		4	7	3	4	4	1	2	4	21	17	38	32	
Willington	2			2		2	1	2	2	3	3				3	1		1	1	1	3	2	2		2	1	11	6	17	12	
Wilton			1		1	3	2	4	6	8	7				7	1	2	1	3		2	4	3	2	3	4	18	14	32	26	
Winchester	15	8	3	5	5	5	7	6	8	16	12	2			12	14	5	2	9	6	6	17	7	4	7	3	49	43	92	99	
Windham	34	19	3	10	22	14	12	12	19	18	13	3		2	19	21	16	16	11	12	15	8	16	13	16	18	90	91	181	206	
Windsor	9	4	3	1	7	5	3	3	10	13	4	1			12	3	2	9	1	5	7	7	5	2	3	7	28	35	63	45	
Windsor Locks	15	6	1	2	7	9	4	3	6	3	1	1			7	3	6	8	6	3	5	6	3	5	4	2	29	29	58	63	
Wolcott	2			1		1		1		3						2			1		1	1		1	1	1	6	2	8	14	
Woodbridge	2	2				1			3	2	4	2			1	1		1		1	2		3	2	2	3	11	5	16	14	
Woodbury	5	1			2	1	4		7	9	6	1			6	2	3			2	5	4	5	2	4	3	19	17	36	31	
Woodstock	6	2		1		3	7	4	9	8	11	1			10	3	7	3	5	2	4	3	4	6	1	4	22	30	52	30	
Total	2540	1162	414	645	1249	1104	1053	1163	1528	1532	988	238	9	40	1693	1107	1119	1124	1005	934	1337	1328	1031	1037	957	903	7016	6642	13665	17394	7

TABLE IX.

DEATHS AND BIRTHS IN TOWNS, ALPHABETICAL ARRANGEMENT, DISTINGUISHED BY NATIONALITY.

TOWNS.	DEATHS.																BIRTHS.													
	NATIVITY OF DECEDENTS.																NATIVITY OF PARENTS.													
	Connecticut.	Other States.	England.	Ireland.	Scotland.	Canada.	Germany.	Italy.	France.	Sweden.	Russia.	Other For. Countries.	Total Native Decedents.	Total Foreign Decedents.	Nativity Unknown.	Total of all Nations.	Both Par. of U. S.	Each of Dif. Nat.	Both Par. English.	Irish.	Scotch.	Canadian.	German.	Italian.	French.	Swedish.	Russian.	Other For. Countries.	Parentage Unknown.	Total Births.
Andover	7												7			7	5													5
Ansonia	156	13	13	40	3		4					2	169	62		231	108	61	28	81	6	8	9			9	8	26		342
Ashford	10	5											15			15	12	1												13
Avon	11	2		3									13	3		16	13	4		1		2	1							21
Barkhamsted	20	5	1										25	1		26	17					1								18
Beacon Falls		1											1			1	5	1				1	3							10
Berlin	32	2	1	3				1		1			34	6	2	42	26	2		2		1	3							34
Bethany	7		1	1									7	2		9	3	1												4
Bethel	38	3		9			1						41	10	1	52	56	12	1	12	3		1			2				87
Bethlehem	7	2											9			9	10	4												14
Bloomfield	18			2		1							18	3		21	17		1	1								1		20
Bolton	4												4			4	3								1			1		5
Bozrah	10	4	1	2									14	3		17	11	2		3		1								17
Branford	51	13	1	11	1					3		2	64	18		82	38	25	6	15		2	4	3		16	6	3		118
Bridgeport	507	137	33	144	7	8	38	3	1	7		14	644	255	15	914	544	254	45	191	8	22	100	22		48	10	242		1486
Bridgewater	9	2		2									11	2		13	6			1						1				8
Bristol	87	15		16		2	1			2		6	102	27	4	133	54	23	2	24	1	14	18	3		13		4		156
Brookfield	23	1		1			1						24	2		26	16		1	2					1	4				24
Brooklyn	35	3	2	3		4							38	9		47	17	6		4		25								52
Burlington	22	2		2			5					1	24	10		34	5	9		2		8	14		1	6				45
Canaan	14	2		3									16	8		19	12	2												14
Canterbury	20	1	2	1									21	3		24	7	2	1				1							11
Canton	31	5		6		1	4			4		1	36	16		52	25	2	2	1		3	8			12				53
Chaplin	7	2											9			9	4													4
Chatham	30	3	1	5					1				33	7		40	21	7					1		1	1				31
Cheshire	26		2	2			1						26	5		31	11	1		3			3							18
Chester	16	3	2	2									19	4		23	14			1		1				1				17
Clinton	28	3											31			31	13						1							14
Colchester	43	4		8			1		1			1	47	11		58	38	14		11		2	1			1				67
Colebrook	9	1							2				10	2		12	10	2							1					13
Columbia	17	2	1	1									19	2		21	9	4				1	1							15
Cornwall	19			1									19	1		20	13	2												15
Coventry	26	5		1		1	1						31	3	1	35	19	8	1			1								29
Cromwell	31	5		8			2			1		1	36	12		48	14	13	3	9		1	1					2		43
Danbury	175	50	7	23	1		8	2	1	1		2	225	45	16	286	260	87	5	73	8	1	47	19	2	2	1	5	5	510
Darien	28	15	8	7	1		1						43	12		55	10	6	1	1								2		20

Derby	70	11	2	15	1		3	2					81	23	3	107	62	33	4	88	2	3	10	5			1	6		164
Durham	12						1						12	1		13	10						2							12
Eastford	8	1	1	1									9	2		11	6	2												8
Easton	17	1											18			18	14	1					2			2				19
East Granby	8	2		1			1						10	2		12	10	3												13
East Haddam	46	2		1									48	1		49	31	8			1						2	2		44
East Hartford	44	13		9			1						57	10		67	43	25	4	15	1	1	4					1		94
East Haven	10	2		1	1								12	2		14	7	2										1		10
East Lyme	21	5	3	3						1			26	7	3	36	21	5	3			1	2			2		1		85
East Windsor	26	3	1	2			4						29	7		36	28	16		1			8							53
Ellington	22	4		2			1						26	3		29	12	5					6							23
Enfield	60	32	4	25		1	1					14	92	45		137	55	28	11	26		35	8							168
Essex	23	6	3	1		1				3			29	8		37	27	4		1						8				85
Fairfield	48	5		2	1							1	53	4		57	33	9		7	1		1			1	1	4		57
Farmington	28	4	1	4	1						1		32	7		39	29	11		5		1								46
Franklin	5			1									5	1		6	4	1		1										6
Glastonbury	55	5	2	2		1	2			1		1	60	9		69	38	8		3			15							64
Goshen	12	3		1								1	15	2		17	15	2							1			1		19
Granby	11	6		1									17	1		18	19			1										20
Greenwich	71	42	5	13		1	11	3					113	33		146	91	34	5	18		1	23	6						178
Griswold	41	13		5	1	11							54	17		71	17	14				24	3				1			59
Groton	85	9										1	94	1		95	77	13		6		7					1	2		106
Guilford	44	4	1	1				1		1			48	4	2	54	35	9		6				2		4		1		57
Haddam	39	1		1			1			4		1	40	7		47	16	5		2	1	1				10				85
Hamden	51	10	3	6			4						61	13		74	37	12	1	1		1	4	1	1			2		60
Hampton	7			1									7	1	1	9	9			1										10
Hartford	645	145	31	226	10	9	45	3		4	5	15	790	348		1138	497	270	14	193	13	20	70	85		24	73	21		1280
Hartland	6	2											8			8	3	1												4
Harwinton	12	1											13			13	10	4	2					1				2		19
Hebron	13	1										1	14	1		15	15	2	1			1						1		20
Huntington	38	14	6	5				1					52	12		64	41	16	5	5	1	3	4	1						76
Kent	19	3		1									22	1		23	24			2			1					1		28
Killingly	84	35	4	11		12							119	27		146	65	33	2	4		74	1							179
Killingworth	12	1											13			13	9													9
Lebanon	25	4				1				1			29	2		31	21	3												24
Ledyard	14	2											16			16	9	1												10
Lisbon	11	2		2									13	2		15	6	2												8
Litchfield	38	4		5			2					1	42	8		50	31	9	2	5			1			1				49
Lyme	19	1		1									20	1		21	12						2				1			15
Madison	22	5		2									27	2		29	15	3	1	1						1				21
Manchester	89	11	5	27	3	1	10			6		1	100	53		153	58	25		80	4	4	9			15		7		202
Mansfield	23	3	1										26	1		27	15	3					3							21
Marlborough	7	2		1			1						9	2		11	5	1					2		1		1			10
Meriden	235	44	16	42	3	14	32	2	1	3		3	279	116	8	398	212	156	38	75	3	47	149	3	1	5		20	1	710
Middlebury	18	3											21			21	8	1												9
Middlefield	7	1		2									8	2	1	11	11	1					1							13
Middletown	192	32	6	68	3	6	14			4		2	224	103	5	332	147	65	6	40	5	1	28	3		17	2			314
Milford	42	6		4	1		1			2			48	8	4	60	33	10		9		1	2							55
Monroe	19	3	1				1						22	2		24	10													10
Montville	38	2	1	3	1	1						2	40	8		48	27	7	1	4		3				4				46

TABLE IX.—Continued.

TOWNS.	DEATHS. Nativity of Decedents. Connecticut.	Other States.	England.	Ireland.	Scotland.	Canada.	Germany.	Italy.	France.	Sweden.	Russia.	Other For. Countries.	Total Native Decedents.	Total Foreign Decedents.	Nativity Unknown.	Total of all Nations.	BIRTHS. Nativity of Parents. Both Par. of U. S.	Each of Dif. Nat.	Both Par. English.	Irish.	Scotch.	Canadian.	German.	Italian.	French.	Swedish.	Russian.	Other For. Countries.	Parentage Unknown.	Total Births.
Morris	2	1	1										3	1		4	7	2		1										10
Naugatuck	78	6	9	20						4			84	33	1	118	66	42	7	28	1	1	5	3		12		7		172
New Britain	178	10	8	63	2		20			12		4	188	109	2	299	173	93	25	41	3	7	57	4	1	64	5	16	71	560
New Canaan	30	16	1	2									46	3		49	43	11	2	2			2							60
New Fairfield	5	2											7		1	8	13			1			3							17
New Hartford	38	2		6		12	1			2		3	40	24	7	71	32	5	1	1		24	4	1				2	1	71
New Haven	1002	207	36	300		8	66	19				60	1209	489	45	1743	738	421	29	305	16	26	184	145		57	96	25	391	2433
Newington	8			2									8	2		10	4	1		2						1				8
New London	174	38	4	40	2	5	4					1	212	56		268	177	71	9	56	3		10	5				9		340
New Milford	43	4		4						1			47	5	9	61	64	8	5	3			3					2	1	86
Newtown	50	3		11								1	53	12		65	25	12	2	8										47
Norfolk	20	6	1	5									26	6		32	12	1		2			1							16
North Branford	8	1											9			9	11						1			1				13
North Canaan	14	6		2								1	20	3		23	16	5		5						1				27
North Haven	21	1		3		1							22	4	2	28	12	3		1		1		3		1				21
North Stonington	20	1											21		7	28	17	2								1				20
Norwalk	172	68	8	45			11	3		1		3	240	71	6	317	260	66	6	36	1	1	27	7		9		4	6	423
Norwich	268	55	10	60	7	22	7			2		5	323	113		436	201	128	17	63	13	64	31			8	16	8		549
Old Lyme	17	3	4					1				1	20	6	2	28	22	3	1				1							27
Old Saybrook	19	2	1	4									21	5		26	28			4				1		1				34
Orange	59	7	2	5		2	1			1			66	11		77	39	11	2	6		1	4			4	2	1		70
Oxford	15			2									15	2		17	19	1		2										22
Plainfield	54	12	1	6		10							66	17	2	85	32	28		4	36	1								101
Plainville	21	3		6									24	6	1	31	21	6	1											28
Plymouth	22	2	1	2			2						24	5		29	32	3	1	3	1		1					3		44
Pomfret	19	8	2	3									27	5		32	25	6		5	1					3				40
Portland	68	1	3	15		1				10			69	29		98	37	38	5	21	2					70		1		174
Preston	26	3	1	1			2						29	4		33	20	5	2	2		1	1							31
Prospect	11	1											12			12	3	1											1	5
Putnam	73	13	3	6		14							86	23	4	113	67	48		1		85							1	202
Redding	23	4		1			1						27	2		29	26	4		1						2		2		35
Ridgefield	33	7		4	1								40	5		45	46	5	2	1			1							55
Rocky Hill	27	1		3									28	3		31	21	3		1										25
Roxbury	21	1		2		1							22	3		25	14	4	2	3										23
Salem	8	1											9			9	7	1										2		10

Salisbury	45	9	....	7	....	....	2	....	....	....	....	....	54	9	....	63	43	16	3	8	....	....	1	....	....	....	....	....	....	71
Saybrook	19	1	....	....	....	....	....	....	....	....	....	....	20	....	....	20	11	1	....	....	....	....	....	....	....	1	....	....	....	13
Scotland	6	1	1	....	....	....	....	....	....	....	....	....	7	1	....	8	9	....	....	....	....	....	....	....	....	....	....	....	....	9
Seymour	45	7	1	2	....	....	2	....	....	....	....	....	52	5	....	57	28	15	2	6	1	1	16	....	....	....	1	1	....	71
Sharon	30	6	....	2	....	....	....	....	....	....	....	....	36	2	....	38	30	7	....	3	....	....	2	....	1	....	....	....	....	43
Sherman	9	5	....	....	....	....	....	....	....	....	....	....	14	....	....	14	10	....	....	1	....	....	1	....	....	1	....	....	....	13
Simsbury	18	2	1	9	....	....	....	1	....	....	....	....	20	11	....	31	34	5	....	3	....	....	....	2	1	1	....	....	....	46
Somers	12	4	....	....	....	1	....	....	....	....	....	....	16	1	....	17	9	6	....	....	....	....	1	....	....	....	....	....	....	16
Southbury	20	....	....	....	....	....	....	....	....	1	....	....	20	1	2	23	10	6	....	1	....	....	2	....	....	2	....	....	....	21
Southington	67	7	4	14	....	....	2	....	....	....	....	....	74	20	....	94	49	23	5	1	1	....	3	9	1	1	....	2	....	95
South Windsor	12	4	....	4	....	1	....	....	....	1	....	....	16	6	....	22	14	....	....	3	....	....	....	....	....	....	....	....	....	17
Sprague	16	6	....	2	....	2	....	....	....	....	....	....	22	4	....	26	3	6	....	1	....	3	....	....	....	....	....	....	....	18
Stafford	41	20	2	3	....	2	1	....	....	....	1	....	61	9	....	70	56	23	2	6	....	25	3	....	....	....	....	2	....	117
Stamford	160	52	2	37	2	....	2	2	....	1	....	....	212	46	9	267	189	87	8	66	4	....	20	11	....	11	4	3	10	418
Sterling	16	6	....	3	....	....	....	....	....	....	....	....	22	3	....	25	9	3	1	....	....	....	....	....	....	....	....	....	....	18
Stonington	70	23	1	31	....	....	4	....	....	....	....	2	93	38	....	131	87	23	4	12	....	1	....	....	....	2	....	7	....	136
Stratford	32	9	2	3	....	....	....	....	....	....	....	....	41	5	....	46	35	7	1	2	....	....	....	....	....	1	....	....	....	46
Suffield	30	15	2	4	....	....	....	....	....	....	....	....	45	6	....	51	36	8	1	6	....	....	....	....	....	....	....	....	....	51
Thompson	50	15	....	5	....	11	2	....	....	3	....	....	65	21	....	86	17	23	1	3	....	63	....	....	....	2	....	....	3	112
Thomaston	28	2	1	10	....	....	....	....	....	....	....	2	30	13	....	43	43	15	8	11	7	....	3	....	....	4	....	1	1	93
Tolland	7	1	1	2	....	....	2	....	....	....	....	....	8	5	....	13	11	3	....	....	....	....	1	....	....	....	....	....	....	15
Torrington	52	7	6	6	....	....	3	....	....	....	....	1	59	16	6	81	70	25	5	9	....	....	10	2	2	1	....	3	....	127
Trumbull	22	1	1	1	1	....	....	....	....	....	....	....	23	3	....	26	14	2	....	1	....	....	1	....	....	....	....	....	....	18
Union	4	....	....	....	....	....	....	....	....	....	....	....	4	....	....	4	6	1	....	....	....	....	....	....	....	....	....	....	....	7
Vernon	69	19	4	15	....	5	18	....	....	....	....	1	88	43	1	132	75	68	12	10	1	6	57	....	....	....	....	1	4	234
Voluntown	12	10	1	....	....	1	....	....	....	....	....	....	22	2	....	24	13	1	....	....	....	7	....	....	....	....	....	....	....	21
Wallingford	56	11	5	16	....	4	4	....	....	....	....	1	67	30	6	103	76	50	11	19	....	6	4	1	....	4	....	1	3	175
Warren	6	....	....	....	....	....	....	....	....	....	....	....	6	....	....	6	5	....	....	1	....	....	....	....	....	....	....	....	....	6
Washington	16	5	1	2	....	....	1	....	....	....	....	1	21	5	....	26	19	....	2	2	....	....	1	....	....	5	....	....	....	29
Waterbury	349	59	14	142	9	14	16	1	....	2	1	1	408	200	18	626	361	215	17	193	6	90	38	19	1	10	11	15	....	976
Waterford	41	5	....	....	1	....	....	....	....	....	....	....	46	1	....	47	13	6	1	1	2	....	....	....	....	3	....	1	....	27
Watertown	18	3	2	6	....	....	....	....	1	....	....	....	21	9	....	30	33	15	....	3	....	....	....	....	2	....	....	....	....	53
Westbrook	12	2	....	....	....	....	3	....	....	....	....	....	14	3	....	17	9	....	....	....	....	....	....	....	....	....	....	....	....	9
West Hartford	22	2	1	4	....	1	....	....	....	....	1	....	24	7	1	32	10	2	1	1	....	....	1	....	....	3	....	2	....	20
Weston	12	2	....	....	....	....	....	....	....	....	....	....	14	....	....	14	5	2	....	2	....	....	....	....	....	1	....	....	....	10
Westport	59	9	1	2	....	....	....	....	....	....	....	....	68	3	1	72	35	8	2	8	1	1	6	1	....	....	....	....	....	62
Wethersfield	31	5	1	1	....	....	....	....	....	....	....	....	36	2	....	38	19	4	....	4	....	....	2	....	....	3	....	....	....	32
Willington	9	5	2	....	....	....	....	....	....	....	....	....	14	2	1	17	6	5	....	1	....	....	....	....	....	....	....	....	....	12
Wilton	23	6	1	1	....	....	....	....	....	....	....	1	29	3	....	32	15	7	....	1	....	....	1	....	....	....	....	2	....	26
Winchester	59	13	3	9	1	2	....	....	....	1	....	1	72	17	3	92	67	18	1	4	2	5	1	....	....	1	....	....	....	99
Windham	114	24	2	22	2	7	1	....	....	....	....	....	138	43	9	181	82	44	2	8	11	52	1	....	....	6	....	....	....	206
Windsor	42	8	3	8	....	....	....	....	2	....	....	....	50	13	....	63	31	10	....	2	1	1	....	....	....	....	....	....	....	45
Windsor Locks	25	6	3	17	....	1	1	4	....	....	....	1	31	27	....	58	25	14	1	16	....	1	2	4	....	....	....	....	....	63
Wolcott	7	....	....	1	....	....	....	....	....	....	....	....	7	1	....	8	10	1	1	1	....	1	....	....	....	....	....	....	....	14
Woodbridge	15	....	1	....	....	....	....	....	....	....	....	....	15	1	....	16	9	5	....	....	....	....	....	....	....	....	....	....	....	14
Woodbury	28	1	2	....	....	....	....	....	....	....	....	....	29	7	5	36	25	3	3	....	....	....	....	....	....	....	....	....	....	31
Woodstock	37	5	1	2	....	....	....	....	4	....	....	....	42	10	3	52	24	....	1	....	....	3	....	....	....	1	....	....	1	30
Total	8586	1721	337	1822	67	204	383	49	14	93	9	165	10307	3160	215	13665	7596	3239	410	2017	131	837	1093	322	20	504	242	483	500	17894

TABLE X.

RECAPITULATION OF TABLES EIGHT AND NINE.

AGES.	1890, Total.	1889, Total.	1888, Total.	1887, Total.	1886, Total.	1885, Total.	1884, Total.	1883, Total.	1882, Total.	1881, Total.	Per Cent. to Total Mortality. 1890.	1889.	1888.	1887.	1886.	1885.	1884.	1883.	1882.	1881.
Deaths under 1 year	2,540	2,440	2,525	2,544	2,441	2,454	2,519	2,422	2,268	2,229	18.5	19.4	19.4	20.5	21.	20.4	22.2	20.3	19.4	20.4
from 1 to 5	1,162	1,135	1,166	1,191	1,069	1,244	1,140	1,241	1,097	1,040	8.5	9.0	8.9	9.5	9.2	10.3	10.1	10.4	9.6	9.6
Total, First Period, Infantile	3,702	3,575	3,691	3,735	3,510	3,698	3,659	3,663	3,365	3,269	27.0	28.5	28.4	30.1	30.2	30.7	32.3	30.7	29	30.
Deaths from 5 to 10	414	494	508	455	411	465	447	599	540	425	3.0	3.9	3.9	3.6	3.6	3.9	3.9	5.	4.6	3.9
10 to 20	645	625	631	595	618	610	504	602	642	579	4.7	4.9	4.9	4.7	5.3	5.	4.4	5.1	5.5	5 3
Total, Second Period, Youth	1,059	1,119	1,139	1,050	1,029	1,075	951	1,201	1,181	1,004	7.7	8.8	8.7	8.4	8.9	8.9	8.3	10.1	10.1	9.2
Deaths from 20 to 30	1,249	1,086	1,090	1,024	975	1,017	999	1,028	1,091	1,033	9.1	8.6	8.4	8.2	8.4	8.4	8.8	8.6	9.4	9.5
30 to 40	1,104	986	987	915	905	864	791	897	832	848	8.0	7.9	7.6	7.3	7.8	7.3	6.9	7.5	7.1	7.7
40 to 50	1,053	938	1,000	914	838	900	759	813	879	751	7.7	7.6	7.7	7.3	7.2	7.5	6.7	6.8	7.5	6.9
50 to 60	1,163	1,035	1,016	1,001	964	985	898	919	876	851	8.5	8.2	7 8	8.	8.3	8.2	7.9	7.7	7.5	7.8
Total, 3d Period, Prod. Age	4,569	4,045	4,093	3,854	3,682	3,766	3,447	3,657	3,678	3,483	33.4	32.2	31.5	30.9	31.7	31.2	30.3	30.6	31.5	31.9
Deaths from 60 to 70	1,528	1,300	1,334	1,272	1,189	1,213	1,101	1,072	1,082	1,029	11.1	10.3	10.2	10.2	10.2	10.2	9.7	9.	9.3	9.4
70 to 80	1,532	1,345	1,487	1,336	1,168	1,186	1,224	1,227	1,157	1,130	11.2	10.7	11.4	10.7	10.1	9.8	10.8	10.3	9.8	10.3
80 to 90	988	941	1,012	841	798	839	743	811	817	741	7.2	7.5	7.8	6.7	6.9	6.9	6.5	6.8	7.1	6.8
90 to 100	238	176	178	181	143	157	132	150	267	164	1.7	1.4	1.3	1.4	1.2	1.3	1.2	1.2	2.3	1.5
Deaths over 100..........	9	6	8	10	5	16	6	11	15	11	.....	.....	.....	.1	.....	.1	.1	.1	.1	.1
Total, 4th Period, Old Age.	4,295	3,768	4,019	3,640	3,303	3,411	3,206	3,271	3,338	3,075	31.4	30 0	31.	29.2	28.3	28.2	28.3	27.4	28.6	28.1
Age not stated..........	40	22	38	106	92	83	88	138	99	76	.2	.1	.2	.8	.8	.7	.8	1.2	.8	.8
Grand Total	13.665	12,529	12,980	12,385	11,616	12,023	11,361	11,930	11,662	10,907	100 0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Nationality.																				
D'ths of those born in Conn.	8,586	7,782	8,269	7,984	7,544	8,052	7,572	7,819	7,715	7,404	62.8	62.1	63.7	64.4	65.	66.9	66.7	65.5	67.	67.9
other States	1,721	1,725	1,626	1,460	1,342	1,316	1,212	1,250	1,279	1,105	12.5	13.7	12.5	11.7	11.6	10.9	10.7	10.5	11.	10.1
Total for the United States	10,307	9,507	9,895	9,444	8,886	9,368	8,784	9,069	9,092	8,509	75.4	77.6	76.2	76.3	76.7	77.8	77.4	76.	78.	78.
D'ths of those born in Ireland	1,822	1,675	1,696	1,613	1,461	1,446	1,299	1,381	1,300	1,251	13.3	13.3	13.	12.2	12.5	12.1	11.4	12.4	11.2	11.5
Germany	383	394	335	357	315	314	278	272	275	273	2.7	3.1	2.5	2.8	2.7	2.6	2.4	2.3	2.4	2.5
England	337	284	319	320	285	292	253	236	266	269	2.3	2.2	2.4	2.5	2.5	2.4	2.2	2.	2.3	2.4
Italy	49	25	55	28	28	34	31	30	48	23	.3	.1	.4	.2	.1	.3	.3	.2	.4	.2
Sweden	93	69	81	29							.6	.5	.6	.2						
Canada	204	180	192	165	173	123	146	134	156	162	1.4	1.4	1.4	1.3	1.5	1.	1.3	1.1	1.3	1.4
other For. Countries	255	231	228	128	186	173	302	220	216	106	1.8	1.8	1.7	1.2	1.7	1.4	2.7	1.8	1.8	1.
Total of Foreign Births	3,143	2,858	2,906	2,640	2,448	2,382	2,309	2,373	2,261	2,084	23.0	22.8	22.3	21.1	21.	97.6	97.7	19.9	19.4	19.1
Nativity not stated	215	164	179	301	282	283	258	488	309	314	1.5	1.3	1.3	2.4	2.4	2.4	2.3	4.1	2.6	2.
Grand Total	13,665	12,529	12,980	12,385	11,616	12,033	11,351	11,930	11,662	10,907	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Seasons.*																				
Deaths in Spring	3,248	3,128	3,390	2,957	2,999	3,403	2,685	3,147	3,046	2,673	23.7	24.9	26.1	23.9	25.8	28.2	23.6	26.4	26.2	24.5
Summer	3,599	3,525	3,491	3,877	3,117	3,273	2,980	3,253	3,121	2,764	26.3	28.1	26.9	31.2	26.8	27.1	26.3	27.3	26.7	25.3
Autumn	3,025	3,039	2,951	2,703	2,820	2,577	2,998	2,658	2,768	2,784	22.1	24.2	19.9	21.8	24.3	21.7	26.4	22.3	23.7	25.5
Winter	3,793	2,837	3,148	2,848	2,680	2,780	2,688	2,872	2,727	2,686	27.7	22.6	24.2	22.9	23.1	23	23.7	24.	23.4	24.7
Total	13,665	12,529	12,980	12,385	11,616	*12033	11,351	11,930	11,662	10,907	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Births.																				
Births in Spring	4,354	4,213	4,010	4,163	3,896	3,808	3,876	3,843	3,538	3,591	25.0	24.4	23.7	25.	24.4	24.6	24.6	24.2	23.7	24.5
Summer	4,412	4,577	4,511	4,193	4,120	4,026	3,998	4,043	3,756	3,615	25.3	26.6	26.6	25.3	25.8	26.0	25.4	25.5	25.1	24.6
Autumn	4,282	4,276	4,344	4,231	4,045	3,929	4,003	4,085	3,932	3,663	24.6	24.8	25.7	25.5	25.4	25.3	25.4	25.9	26.4	25.1
Winter	4,346	4,110	4,013	3,996	3,873	3,733	3,881	3,885	3,712	3,747	24.9	23.9	23.7	23.3	24.4	24.1	24.6	24.4	24.8	25.7
Total	17,394	17,176	16,878	16,583	15,934	15,496	15,758	15,856	14,938	14,616	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

* A few not stated by seasons are distributed equally.

TABLE XI.

CAUSES OF DEATHS BY MONTHS, AGE AND SEX, ALPHABETICALLY ARRANGED.

January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	DISEASES.	Under 1.	1 to 5.	5 to 10.	10 to 20.	20 to 30.	30 to 40.	40 to 50.	50 to 60.	60 to 70.	70 to 80.	80 to 90.	90 to 100.	Over 100.	Age not stated	Male.	Female.	Sex not stated.	Total.
2	2	1	2	3		1	6		3		1	Abscess	4		1	1	1	2	2	2	4	4					14	7		21
						1						Abdominal								1								1		1
1	1								1			of Brain			1	1			1								1	2		3
						1						of Lung									1						1			1
						1						Pelvic					1											1		1
1												Perineal									1							1		1
					1		1	1	1		1	Abortion and Miscarriage					1	4										5		5
5	1	1	3	1	3	3	3	3		3	5	Accidents			3	6	5	1	5	1	3	6		1			25	6		31
1												Caught in Shafting					1										1			1
					1							Crushed by Bridge					1										1			1
					1							Pile Driver									1						1			1
									1			Explosion of Fulminate							1								1			1
										1		Oil Can					1										1			1
						1						Falling from Bicycle					1										1			1
											1	Roof						1									1			1
1						1						Falling Tree					1					1					2			2
									1			Kicked by Horse				1											1			1
					1							Premature Blast								1							1			1
									1			Run Over by Wagon							1								1			1
									1			Sandbank, Caving in of								1							1			1
	1		1						1			Thrown from Wagon							3								3			3
1												Albuminuria					1										1			1
7	1	5	2	5	4	4	4	11	3	5	5	Alcoholism					5	14	17	12	7	1					37	19		56

		2	1	1	3	3	4	2	6	1	3	Anæmia	6	1	1	3	6	2	1	3	1	2					10	16		26
							1					Anasarca									1						1			1
	1	1					1	1	1		2	Aneurism					1	1	1	3			1				5	2		7
		1				1	1		1		2	of Aorta						1			1	2	2				3	3		6
7	3	5	7	9	5	2	3	5	4	5	4	Angina Pectoris	1	1		1	2	5	4	11	12	10	11	1			28	31		59
50	37	49	50	40	34	49	56	37	41	49	48	Apoplexy	12	7	2	5	7	21	45	73	132	148	78	9		1	251	289		540
										1		Arthritis			1													1		1
2		1	1		2	1	2	1			1	Ascites						2	2	2	2	1	1			1	3	8		11
2	2	2	1	2	2	1	3	1	1	1		Asphyxia	13	2		1				1	1						13	5		18
	1	2	1						2		2	Asthenia					3		2	1	1	1					5	3		8
3	3	2	1	1	2		3	1	4	1	2	Asthma	2				1	3	3	3	5	3	3				12	11		23
1				2		2		1	2	1	2	Atalectasis	11														2	9		11
				1	1	1						Atheroma of Arteries										3					2	1		3
		1	3	2		1	3					Bladder. Disease of		1			1		1	1	4	2					9	1		10
1			2					1		1		Brain, Disease of	1				1		1		1	1					3	2		5
9	8	19	14	14	11	19	17	9	10	9	9	Inflammation of	45	45	9	7	5	10	7	8	4	7	1				87	61		148
	1		1	1				1	2			Paralysis of		1						1	3	1					2	4		6
8	4	7	8	13	8	2	8	7	6	10	9	Softening of	2				2	2	5	16	15	37	10			1	55	35		90
		2					1	2				Tumor of				1		3		1							3	2		5
27	20	23	31	30	19	28	17	21	19	25	34	Bright's Disease	1	3	1	13	25	21	40	56	70	49	12	3			172	122		294
88	44	36	32	28	20	12	21	19	18	41	25	Bronchitis	90	48	6	4	15	19	21	46	40	46	37	10		2	189	195		384
10	5	10	5	6	5	1		4	9	8	3	Capillary	38	12	2	1	1	2	1	4	2	3					36	30		66
4	3	2	2	2	2	4	1	1	6	4	6	Burns and Scalds		17	2	2	1	3		3	2	5	1	1			13	24		37
	2											Calculus	1								1						1	1		2
2	1								1			Cancer of Abdomen							1		2	1						4		4
		1				1						of Bladder								2							1	1		2
3	5	3	5	3	1	1	4	5	3	6	6	of Breast					2	1	8	12	10	6	5	1				44	1	45
1	1			1		1		1	1			of Bowels								3	1	2					1	5		6
	1					1				1		of Colon								3							1	2		3
1						1						of Ear											2				1	1		2
					1							of Eye											1					1		1
1	1				1			2	1	2	2	of Face		1						2		4	3				7	3		10
							1					of Foot										1						1		1
		1			1				2			of Intestines						1	1	1		1						4		4
	1	1						1			1	of Jaw							2	1		1					3	1		4

TABLE XI.—Continued.

January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	DISEASES.	Under 1.	1 to 5.	5 to 10.	10 to 20.	20 to 30.	30 to 40	40 to 50.	50 to 60.	60 to 70.	70 to 80.	80 to 90.	90 to 100.	Over 100.	Age not stated.	Male.	Female.	Sex not stated.	Total.
			1				1	1				Cancer of Kidneys							1		1		1				2	1		3
						1	1		1			of Larynx								1	1		1				2	1		3
4		2	2									of Lip								1	3		4				5	3		8
1	1	4	2	3	5	3	4	1	4	6		of Liver						1	4	10	14	4	1				11	23		34
						1						of Mouth							1								1			1
1		1		1			1					of Neck		1						2	1						3	1		4
											1	of Ovaries						1										1		1
	2		3		1							of Pancreas								3	2	1					3	3		6
											1	of Penis									1						1			1
				1								of Prostate									1						1			1
	1		2		1		2	1		1		of Rectum							2	3	3						3	5		8
1												of Spleen								1								1		1
							1					of Spine							1									1		1
5	8	2	6	3	7	9	2	7	4	5	8	of Stomach						9	7	12	16	17	5				31	35		66
											1	of Testicle						1									1			1
		1									1	of Thorax								1	1						2			2
1		1							1		2	of Tongue							1	3	1						5			5
2	3	4	1	4		6	2	4	3	6	3	of Womb						3	10	15	4	3	2	1				38		38
10	6	7	8	12	5	9	6	6	12	4	8	not Located	1		2	2	3	5	11	21	18	17	11	2			30	63		93
1		2									1	Carbuncle				1				1		2					3	1		4
						1						Caries									1						1			1
											1	of Spine								1							1			1
			1									Catarrhal Croup		1														1		1
3	3	3	3	5	1	2	6	3	1	3	2	Cause not reported	17	2		1	1	1	4	2	2	4				1	20	14	1	35
6	11	14	8	12	11	12	11	10	10	7	13	Cause Ill-defined	42	3	1	1	4	5	10	8	16	27	8				61	63	1	125

										1		Cellulitis						1										1		1
15	18	22	15	10	17	13	17	14	7	12	7	Cerebral Meningitis	47	50	22	14	8	7	9	1	4	4	1				95	72		167
1			5		4	4		1	3	1	3	Cerebro-Spinal Meningitis	7	9		4	1			1							9	13		22
			1									Chicken Pox	1															1		1
5	1	5	7	4	2	4	8	4		3	1	Childbirth, Accidents of	16			1	8	15	4								9	35		44
		1										Chlorosis				1												1		1
2		5	3	2	38	270	241	74	17	6	2	Cholera Infantum	565	93	1	1											346	313	1	660
						9	16	2		1		Morbus	3	1	2	1	1	3	3	5	4	2	2	1			11	17		28
			1	1	1			1			1	Chorea			1		1		1	1	1						2	3		5
13	12	8	5	11	11	16	8	9	10	11	5	Circulatory System, Dis. of	5	2	1	9	3	2	11	17	28	25	13	3			60	59		119
			1									Cirrhosis of Kidney								1							1			1
6	8	3	6	5	4	5		2	4	2	3	of Liver					1	6	13	7	15	5	1				30	18		48
					1	1	1					Colic	2			1											1	2		3
			1					1				Coma								1		1					1	1		2
1			1						2		1	Concussion of Brain			1	3						1					4	1		5
1												Congestion	1															1		1
1			1									of Brain				1					1						1	1		2
194	139	140	122	136	129	116	116	108	115	123	103	Consumption	30	24	14	160	463	332	202	128	104	58	19	1		6	771	769	1	1541
		1										Grinder's							1								1			1
		1	1						2	1		Constitutional Disease	3	1							1						2	3		5
26	24	20	26	18	32	24	27	20	23	19	23	Convulsions	185	77	10	2	3	1				3	1				138	144		282
			1									Croup, Catarrhal		1													1			1
18	16	8	9	10	9	4	3	9	8	14	13	Membranous	23	78	15	4	1										68	53		121
	5	5	1	2	1	1	2			2	1	Cyanosis	18	1		1											10	10		20
2	4	3	6	2	3	3	5	4	7	1	4	Cystitis							2	3	12	15	11	1			40	4		44
29	24	18	28	11	18	25	19	22	31	16	17	Debility, Atrophy, Inanit.	180	5	1	2	1	5	4	5	20	15	10	6		4	141	117		258
1											1	Delirium Tremens						1			1						1	1		2
3	1	5	1	3	2	4	7		2	1	1	Dentition	22	8													20	10		30
5	8	3	11	4	6	6	3	2	7	1	6	Diabetes		1	1	3	6	4	2	9	20	13	3				31	31		62
1	1	2	4	6	6	16	25	9	5	5	2	Diarrhœa	17	7	1	1	3	1	5	5	12	16	11	3			44	38		82
5	7	5	3	4	9	83	59	30	12	4	1	Infantile	191	30	1												127	95		222
		3	3			2	2	1	1	3		Digestive System, Dis. of			2	2	2			1	3	3	2				8	7		15
49	33	55	42	40	34	28	20	26	43	36	29	Diphtheria	14	196	154	46	13	5	5		2						188	247		435
5	14	5	4	3	5	7	6	6	3	9	4	Dropsy	1	1	1	1	3	3	4	9	16	23	7	2			26	45		71
4	1	6	4	10	10	11	11	8	1	3	2	Drowning		8	9	17	13	6	9	4	3				1	1	61	10		71

TABLE XI.—CONTINUED.

January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	DISEASES.	Under 1.	1 to 5.	5 to 10.	10 to 20.	20 to 30.	30 to 40.	40 to 50.	50 to 60.	60 to 70.	70 to 80.	80 to 90.	90 to 100.	Over 100.	Age not stated.	Male.	Female.	Sex not stated.	Total.
1	1	...	4	1	2	23	34	20	9	1	1	Dysentery	16	9	4	2	4	5	4	7	13	17	14	1	1	...	29	68	...	97
3	2	2	2	1	3	1	1	4	...	2	4	Dyspepsia	9	1	...	...	1	1	...	4	...	6	3	...	...	...	7	18	...	25
...	...	...	...	...	...	...	...	...	2	...	...	Eczema	...	...	...	...	...	2	...	...	...	...	...	...	...	...	...	2	...	2
1	...	1	4	...	3	...	1	...	2	1	2	Embolism	...	...	...	...	1	...	2	4	3	4	1	...	...	...	11	4	...	15
...	1	...	...	...	...	...	...	...	...	...	...	Cerebral	...	...	...	...	...	...	...	...	1	...	...	...	...	...	1	...	...	1
...	...	...	...	...	...	...	...	2	...	...	1	Emphysema	1	...	...	...	1	...	...	...	...	...	1	...	...	...	2	1	...	3
...	1	...	...	...	...	...	...	...	...	1	...	Empyæmia	...	...	...	1	...	1	...	...	...	...	...	...	...	...	2	...	...	2
...	...	2	...	...	...	1	...	...	...	1	...	Encephalitis	1	1	...	...	1	1	...	...	...	...	...	...	...	...	1	3	...	4
1	...	...	...	...	...	...	...	...	1	...	...	Encephalocele	1	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	1
...	...	...	...	...	...	...	...	...	1	...	...	Enchondroma of Ilium	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	1	...	1
1	1	...	...	...	...	...	...	...	1	...	...	Endarteritis	...	...	...	...	...	...	...	1	...	...	2	...	...	...	2	1	...	3
6	4	2	3	9	4	5	6	4	7	1	5	Endocarditis	1	...	2	3	3	5	7	8	12	9	6	...	...	...	25	31	...	56
...	...	...	...	...	...	...	1	...	...	...	...	Enteralgia	...	...	...	...	...	...	...	...	1	...	...	...	...	...	1	...	...	1
7	4	6	7	6	8	12	23	19	12	7	6	Enteritis	33	9	3	7	10	9	8	4	18	12	2	1	...	1	54	63	...	117
3	3	5	3	7	6	4	4	4	1	4	3	Epilepsy	1	1	1	8	15	5	6	5	3	2	...	...	...	...	27	20	...	47
3	7	6	9	6	3	3	4	2	1	...	1	Erysipelas	8	...	...	1	...	5	4	3	15	5	4	...	...	...	21	24	...	45
3	3	2	2	5	2	2	8	4	1	...	7	Exhaustion	16	2	...	...	...	1	4	1	7	7	1	...	...	...	19	20	...	39
...	...	1	...	...	...	1	...	...	...	...	1	Exposure	...	...	...	...	...	1	1	...	...	...	...	1	...	...	1	2	...	3
1	2	4	5	2	3	3	10	9	2	3	5	Falling	...	3	3	...	5	9	4	2	8	8	6	1	...	...	34	15	...	49
...	1	...	...	...	...	...	...	...	...	1	...	Fistula	...	...	...	...	...	1	1	...	...	...	...	...	...	...	2	...	...	2
...	...	...	...	...	...	1	...	...	...	...	...	Found Dead	...	...	...	...	...	...	...	1	...	...	...	...	...	...	1	...	...	1
1	2	3	1	...	1	3	3	1	1	1	2	Fractures and Contusions	...	2	...	1	2	4	1	1	3	1	3	1	...	...	15	4	...	19
...	1	1	1	...	...	1	2	1	1	...	...	Fracture of Hip	...	...	...	...	...	...	...	...	1	2	4	1	...	...	4	4	...	8
...	...	...	...	...	1	...	...	...	1	...	...	of Leg	...	...	...	...	...	...	1	...	1	...	...	...	...	...	1	1	...	2
...	1	...	...	...	...	1	...	...	1	...	1	of Neck of Femur	...	...	...	...	...	...	...	...	1	...	3	...	...	...	...	4	...	4

					1							Fracture of Rib						1									1			1
1	4	2		2	4	3	2	2	6	2	2	of Skull	1		2	2	8	4	7	3	2	1					30			30
1											2	Freezing	1						1			1					3			3
	1		1			1	1					Gall Stones					1		1	1	1						1	3		4
	1			1	1					1		Gastric Fever		1	1				1			1					2	2		4
	1		2	4		3	2			1	1	Gastritis	4				1			2	4	1	2				5	9		14
									1	1		Gangrene		1							1							2		2
				1			2		1			of Lung					1			2		1					2	2		4
		1										Gonorrhœa								1							1			1
										1		Giotre Exophthalmic					1											1		1
			1		1	1	1	1				Hæmatemesis					1				2	1	1				2	3		5
				1							1	Hæmatocele	2														2			2
1	1	3	2		2	2		1				Hæmaturia					1		2	2	3	3	1				6	6		12
6	3	2	2	1	6	1	7	6	1	1	5	Hæmorrhage	12				5	2	5	6	3	5	1	2			23	18		41
								1				from Varicose Veins							1								1			1
1												Heart, Atrophy of										1						1		1
51	37	29	37	36	28	35	34	31	36	33	46	Disease of	16	5	5	14	21	28	48	67	92	93	39	5			238	194	1	433
5	1	4	2	2	2			6		2	2	Fatty Degeneration of					1	2	4	5	7	4	2			1	15	11		26
7	3	4	4	1	2	2		2	2	1	4	Failure	1			1	3	2	2	1	8	12	2				11	21		32
9	7	4	9	7	3	3	4	6	8	2	7	Hypertrophy of		1	3	5	3	3	7	7	17	15	6	2			36	33		69
						1	1	1	1		1	Paralysis of					1	1	1	1	1						3	2		5
24	12	11	13	9	15	20	16	16	12	12	16	Valvular Disease of	5	1	3	12	7	13	25	15	41	33	18	3			99	77		176
5	2	1	3	3	1	1	2	5	1	1	6	Hemiplegia	1					4	1	1	7	15	2				17	14		31
3	1	8	5	4	3	1	1	2	1	3	2	Hepatitis	1		1				5	5	12	7	3				15	19		34
								1				Herpes Zoster										1						1		1
	2	3	4		1	2	1	4		2	1	Hernia	3	1					2	3	5	5	1				15	5		20
	1	1			1		1				1	Hip Joint Disease			4	1											4	1		5
3	3	1	4	3		2	1	2	3		2	Hydrocephalus, not acute	15	7							1	1					13	11		24
									1			Hydrophobia				1											1			1
1				1								Hydrothorax					1					1					2			2
										1		Hysteria					1											1		1
				1		1						Imperforate Anus	2														1	1		2
83	52	14	14	7	5	2	4	1		2	1	Influenza	13	8	2	2	10	21	11	26	25	38	23	5		1	83	102		185
5	11	3	4	6	6	5	6	5	5	8	10	Insanity					5	9	9	14	15	14	8				27	47		74
				2	2			2				Integumentary Syst., Dis. of									2	3	1				2	4		6

TABLE XI.—CONTINUED.

January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	DISEASES.	Under 1.	1 to 5.	5 to 10.	10 to 20.	20 to 30.	30 to 40.	40 to 50.	50 to 60.	60 to 70.	70 to 80.	80 to 90.	90 to 100.	Over 100.	Age not stated.	Male.	Female.	Sex not stated.	Total.
1	2	1		1	2			1	2	2	2	Intemperance					1	5	2	3	1	2					11	3		14
				1	2		2			1		Intermittent Fever	1					1	1	1	1	1					4	2		6
2	3	4	1	1	8	1	1	1	5	2	2	Intestines, Obstruction of	6		1	1	2	4	2	5	2	4	2	2			16	15		31
	2	2	1		2							Intussusception of	4	1			1		1								4	3		7
1				2			1				1	Strangulation of	1			1			1	1			1				5			5
1					3	1	1		2	1		Ulceration of	2	1		1	1	3								1	6	3		9
		1	5	1	4	4		4	3	3	2	Infantile Debility	24	3													14	13		27
4	4	1				2	1	2	1	2		Jaundice	9								2	4	2				9	8		17
								1		1	1	Kidney Disease						1				1	1				2	1		3
			1									Laryngismus Stridulus	1														1			1
1	1	4	1	1	1	2	1		2	1	2	Laryngitis	3	12					1	1							10	7		7
	1							1	2	1		Larynx, Trachea, Dis. of	1									3	1				1	4		5
1		1	1				1					Leucocythemia						1	1	2							3	1		4
2	3	3	3	4	5	2	5	6	6	7	6	Liver, Disease of	8	1		1	2	2	8	9	13	6	1	1			26	26		52
	1		1	1	1	2				1		Locomotor Ataxia						1		1	3	2					4	3		7
	2											Lupus								1		1						2		2
2	3	2	1	4	2	2	3	2	2	4	1	Malarial Diseases	3	1	1		3	2	2	3	8	2	2	1			10	18		28
4		1	3	1	1	1	3	1	4		1	Fever	1	1	3	3	4	2		4		1	1				8	12		20
1		2	2	1	2	2	2	1	1			Malformation, Congenital	13	1													7	7		14
		1										of Heart		1													1			1
								1				Manslaughter							1								1			1
2	2	1	3	2		5	7	1	1	1	2	Marasmus	21	5				1									14	13		27
1	1	2	3		3	4	1			1	2	Measles	7	6	1		1	1	2								8	10		18
				1								Melancholia								1								1		1
2	2		1			1			3			Meningitis	4	3		1				1							6	3		9

		1			1							Metritis					1					1						2		2
2	1	1		1			1		2	2		Miasmatic Disease		3	2	1	2	1		1							6	4		10
				1								Mumps			1												1			1
				1	1	1	1	1				Murder					3	1		1							4	1		5
		1	1		3			2	1	1	1	Myelitis				1		3		2	2	2					5	5		10
						1		1	1		2	Necrosis		1			1	1			1		1				2	3		5
2	5	10	7	3	7	7	8	7	8	6	7	Nephritis			1	1	8	6	11	14	19	9	5	1		2	44	33		77
4			1	1		1	1	1			1	Nervous Prostration				1	2		1	1	1	2	2				1	9		10
10	5	8	5	10	6	11	10	7	7	10	6	System, Disease of	1			1		3	8	2	17	32	28	3			44	51		95
			1									Neuralgia										1						1		1
					2							Neuritis					1				1							2		2
1			1									Nervous Fever							1			1						2		2
1											1	Oedema of Lungs				1						1					1	1		2
91	59	45	58	43	42	56	56	42	46	46	54	Old Age								1	21	142	139	115	9	1	259	379		638
		2							1			Otitis				2					1						1	2		3
1			1	1			1				1	Ovaries, Disease of					1		2	2								5		5
	1			1	1				1	2		Ovarian Tumor						1		2		3						6		6
1		1		2	2	1				2	1	Paraplegia				1	2			1	2	1	2	1			6	4		10
18	8	10	17	17	5	11	7	7	9	8	15	Paralysis	1	3		1	1	3	7	17	23	39	29	7		1	61	71		132
3	3	3	1	2	3	2	4	3	5	3	4	Paralysis Agitans						1	3	2	9	12	7	2			22	14		36
2	1	2			1	1	1	2	3			Paresis						3	2	3	3	1	1				12	1		13
2	3	2	1	3		1	2	3	11	2		Pericarditis				3	6	3	1	3	8	5	1				20	10		30
9	6	13	8	18	8	15	9	8	8	8	10	Peritonitis, not puerperal	3	3	8	22	21	20	12	8	17	4	2				52	68		120
											1	Periostitis		1													1			1
					2	1						Perityphlitis			1			1	1								1	2		3
2			1		1	1	1	1	1	1		Pernicious Fever	1	1	1	1	1		1	1	1		1				4	5		9
											1	Phagedena									1						1			1
											1	Phlebitis										1					1			1
	1			1							1	Placenta Previa	2					1									2	1		3
5	2	6	2	3		4			2	3	4	Pleurisy			1	7	3	5	3	4	3	3	2				21	10		31
416	171	162	177	107	44	33	29	40	62	79	117	Pneumonia	179	106	35	55	139	142	160	165	185	175	76	16		4	791	646		1437
1					1		1	1				Poison					1	2		1							1	3		4
	1											Carbolic Acid		1														1		1
1											1	Lead					1			1							2			2
			1	1			1		1	2		Opium	1					2	2	1							4	2		6
									1			Rat Poison									1						1			1

TABLE XI.—CONTINUED.

January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	DISEASES.	Under 1.	1 to 5.	5 to 10.	10 to 20.	20 to 30.	30 to 40.	40 to 50.	50 to 60.	60 to 70.	70 to 80.	80 to 90.	90 to 100.	Over 100.	Age not stated.	Male.	Female.	Sex not stated.	Total.
					1							Poison, Strychnia									1						1			1
			1									Water Gas					1										1			1
											1	Yellow Jasmine							1								1			1
									1	1		Pott's Disease					1			1							1	1		2
28	12	18	14	19	14	16	14	17	19	13	16	Premature Birth	200														108	92		200
		1	1	2			1	2	1			Prostatitis						1			2	4	1				8			8
		2	1	1		1	2	1	1		1	Puerperal Convulsions				2	4	3	1									10		10
4	8	6	3	2	2	2	1	4	2	6	3	Fever				4	22	12		1	2	1	1					43		43
	1	1							2	1		Hæmorrhage					1	1	1	1			1					5		5
1	1			1		1					1	Mania					4	1										5		5
3			1		1	2					1	Septicæmia					3	3	2									8		8
2	1	1			1	1	1	2	1			Purpura	5			2			1	1	1						3	7		10
1	5	3	1	2	2	3	1	1	2	1	2	Pyæmia	2	1		1	4	2	3	4	3	2	2				15	9		24
									1			Pyelitis					1											1		1
2	1		3				3		1			Quinsy		5	3	1					1						6	4		10
9	8	7	7	12	14	15	18	11	14	17	11	Railroad Injuries			4	10	41	38	15	13	14	1	1			6	133	10		143
2		2	1			1	3		2	4	1	Remittent Injuries	1	1	1	3	1	2	1	2	1	1	1			1	8	8		16
1	3		3		1	1	2	2		3	1	Respiratory Disease	1		1		1	3	1	1	5	3	1				7	10		17
10	11	9	14	10	6	7	3	7	13	11	8	Rheumatism	2	2	4	7	12	6	10	13	27	18	7	1			60	49		109
						1				1		of Heart							1		1						1	1		2
							1			1		Salpingitis						1	1									2		2
9	7	8	7	8	2	3	2	1	6	8	6	Scarlet Fever	7	34	19	5	2										32	35		67
1	3	2		2	3	3	3	6	5	2	1	Scrofula	10	5		2	3	2	3	1	2	3					22	9		31
	2	3	1	3		2		1	1	2		Senile Gangrene						1			2	4	5	3			8	7		15
		1	3			1	2	2	1	2	1	Septicæmia	1	1	1		6		1	1	1	1					4	9		13

					1							Shock									1						1		1
1	3	8										Small Pox	1	1	1	2	6		1							6	6		12
		1		1			3	1	2		1	Spina Bifida	9													3	6		9
4	2	5	3	1	8	1	3		1	3	2	Spinal Meningitis	3	12	6	2	1		1	3	2	2				19	14		33
3		2	3	1	1	1	1	1	1	3	1	Spinal Cord, Disease of	2	1	1	3		1		3	3	2	2			6	12		18
				1								Cirrhosis										1				1			1
	1		1		1	1						Spine, Injury to									1	2	1			3	1		4
1					1							Strangulation	1			1										2			2
									2		1	Stricture of Œsophagus							1	2						2	1		3
7	7	11	5	8	15	8	14	11	10	8	13	Stomach Disease	21	8		2	7	11	10	19	20	9	8	2		41	76		117
1	1	1	1			1				1	1	Stomatitis	3	1						1	1	1				4	3		7
	1		1		1	1		1	2	1	2	Sudden Death	1					4	2		1	2				6	4		10
1				3			1	1	1	5	2	Suffocation	5				3	1	3	1				1		8	6		14
	1	1	1		1					1		Suicide					1	2	1				1			4	1		5
							1				1	by Arsenic				1			1							1	1		2
2	1				2	1	2		1	2	1	by Cut						3	3	1	1	2	2			12			12
	2	3	1	4	5	3	3	1	2		3	by Drowning		2	1	5	4	5	6	1	2	1				23	4		27
1		1		2	4	2	3	3		1		by Gunshot				2	4	2	4	1	3	1				16	1		17
1			2	4	1	1		2	4		1	by Hanging					2	3	2	4	3	1	1			13	3		16
1												by Jumping from Build.						1								1			1
1												from Window									1						1		1
	1	3		2				1				by Opium				1		1	2	3						5	2		7
						1		1				by Paris Green						1			1					2			2
						1			1			by Poison						1		1						2			2
1				1								Starvation	1	1												1	1		2
					1	7	1			1		Sunstroke					2	1	2	1	1	2		1		10			10
	1											Effects of											1			1			1
												Surgical Operation																	
			1									Amputation of Leg									1					1			1
				1								Hemor. after Circumcis.	1													1			1
				1								Laparotomy					1										1		1
					1							for Tongue-tie	1													1			1
2			2			3	4	1		2		Syncope	2			2		2		2	1	2	2	1		7	7		14
2	1	2					2		1		2	Syphilis	2	3			1	1	1	1	1					5	5		10
3	2	4	4	5	3	12	11	9	4	2	3	Tabes Mesenterica	39	8		1			3	4	3	4				36	26		62
1	1	4	1	2	1	1	2	1	3			Tetanus	9		1	1	1	1		1	3					10	7		17
4	1	2	3	5	3	1	4	7	4	8	6	Thrombosis				1	2	4	4	3	14	12	7	1		25	23		48
		1			2	2		3	2		5	Trismus Nascentium	14		1											9	6		15

TABLE XI.—CONTINUED.

January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	DISEASES.	Under 1.	1 to 5.	5 to 10.	10 to 20.	20 to 30.	30 to 40.	40 to 50.	50 to 60.	60 to 70.	70 to 80.	80 to 90.	90 to 100.	Over 100.	Age not stated.	Male.	Female.	Sex not stated.	Total.
10	4	7	8	10	9	10	6	5	11	8	5	Tubercular Meningitis	41	37	2	5	2	3	2			1					52	41		93
									1			Osteitis					1										1			1
4	7	4	5	3	5	5	6	7	6	3	3	Tuberculosis	6	7	1	8	17	8	2	5	2	2					27	31		58
1												Abdominal		1														1		1
5		2	1	3	2	4	1	7	1		4	Tumor		2	1	1	2	3	4	5	10	2					11	19		30
					1							of Eye		1													1			1
									1			of Bowels									1							1		1
		1	1	1								Uterine								2		1						3		3
							1					Typhlitis						1										1		1
25	17	11	14	13	12	18	33	49	56	41	23	Typhoid Fever		9	9	69	103	41	29	24	15	10	2			1	195	117		312
1	1		3	2	1	2	2		4			Typho-Malarial Fever	1	1	2	3	2	2	3	1	1						8	8		16
								1	2			Typhus Fever							1		1	1					3			3
1	2	3	1	1	1	3	2	2	3		2	Ulcer of Stomach		2	1	1	2	2	3	3	4	2	1				16	5		21
1							1					Umbilical Hernia							2									2		2
2	2	1										Hæmorrhage	5														1	4		5
2	5	4	6	1	4	5	2	4	1	3	2	Uræmia		1		1	6	7	1	5	8	9	1				17	22		39
				1						1		Urinary Calculus									1	1					1	1		2
1		2	1		1	1	3		3			System, Disease of						1	2	1	3	1	4				6	6		12
							1					Urine, Suppression of									1						1			1
1			1	1	1			1	2			Uterine Disease						1	1	1	2	2					1	6		7
1												Uterus, Inversion of								1								1		1
			1									Rupture of						1										1		1
					1							Vertebra, Dislocated								1							1			1
14	14	8	10	12	10	19	20	12	8	5	5	Whooping Cough	77	57	3												57	80		137
		2				1	1					Wounds, Gunshot				1	2	1									4			4

TABLE XII.

OCCUPATIONS AND AGES OF DECEDENTS.

OCCUPATIONS.	15 to 20.	20 to 30.	30 to 40.	40 to 50.	50 to 60.	60 to 70.	70 to 80.	80 to 90.	90 to 100.	Over 100.	Age not stated.	Total, 1890.	Total, 1889.	Total, 1888.	Total, 1887.	Total, 1886.	Total, 1885.	Total, 1884.	Total, 1883.	Total, 1882.	Total, 1881.
Accountants			1		2	1						4									
Actresses					1							1	2								1
Agents			1		1	1		1				4		3	5	2	8	6	11	11	10
Architects		1			1	1	1					4	1	3					2		
Artists				1	2	2	1					6	1	5	4	5		3	2		4
Authors								1				1									1
Axle Makers				1				1				2	1			1		1			
Baggage Masters		1	1									2	2	6			1	3			1
Bakers		2	1	1	2	2						8	4	8	4	7	3	10	7	3	4
Bankers			2				2	2				6	7	1	9	6	3	7	4	1	4
Barbers	2	4	6	1	1							14	10	19	17	5	14	12	9	6	3
Bar Tenders		2	4	1	1	1	1					10	1	15	10	8	8	2	2		3
Basket Makers		1						1				2	3	1	2	1	1	2	1	2	3
Blacksmiths		1	6	6	6	16	8	7	2		2	54	46	37	54	46	42	36	54	28	37
Bleachers				1	1							2	1	2							
Boatmen					3							3	2		4	2	1	2	9	4	
Boiler Makers		1										1	3	1	5	2	2		1		
Bolt Makers			1		1							2	3				2				
Bookbinders		1										1		2	1	1	3	1	2	2	4
Book-keepers	2	3	2	1	2	3	3					16	24	32	14	17	16	18	25	14	11
Bottlers		1										1			1		3	1			
Box Makers		2										2		10	1				2		
Brakemen	1	18	6	2								27	22	14	18	9	15	14	18	4	9
Brass Finishers				2								2		19	1	1	1	1			
Moulders		2	1		1							4	1	1	3		3	4			
Rollers			1				1					2						2			
Turners		1										1	1	1	1	1	1	1			
Workers		1	1									2	3	3	3	1					
Brewers				1	1							2		3	2	1	1	2			2
Bricklayers	1	1	2	1								5		3	2	3	1				
Makers		1	1			1						3		3	1	1	1	1	2	2	5
Brokers			1			2	3	1				7	4	1	5	1	3	2	3	2	2
Brush Makers				1		1						2					1				
Buffers		3	1	2	1							7	5	8	6	5	2	1			
Builders				1		1	3	1				6	3	16	4	9	3			3	
Burnishers			3	2	2							7	1	12	5	6	7	3	8		1
Butchers	1	10	4	5	1	1	2	1				25	26	25	17	16	17	12	25	9	13
Button Makers				1								1			2	1		1			
Cabinet Makers					1	1	2	1				5	10	11	4	4	6	5	6	3	5
Carmen			2	3		1						6	8		2	5	3	2		2	1
Carpenters	1	6	17	21	25	24	28	4				126	126	94	79	80	65	83	78	60	60
Carpet Printers		1			1							2									
Weavers	1							1				2		1	1						2
Carriage Makers			1			2	2					5	11	14	6	8	10	17	8	8	13
Painters			1		2	1						4	2	8	4	1	2	1	7		2
Trimmers						1		2				3	4		5	3	1	3			

TABLE XII.—CONTINUED.

OCCUPATIONS.	15 to 20.	20 to 30.	30 to 40.	40 to 50.	50 to 60.	60 to 70.	70 to 80.	80 to 90.	90 to 100.	Over 100.	Age not stated.	Total, 1890.	Total, 1889.	Total, 1888.	Total, 1887.	Total, 1886.	Total, 1885.	Total, 1884.	Total, 1883.	Total, 1882.	Total, 1881.
Chemists					1							1	1		1			1			
Cigar Makers	1	3	2	1		1	1	1				10	14	16	10	6	5	6	6	5	4
Civil Engineers		2		1		1						4	4		1	1		3	3	1	
Clergymen			2	1	3	2	6	3				17	27	26	27	15	21	24	29	18	23
Clerks	8	29	19	14	3	4	2					79	50	76	44	55	67	46	63	32	66
Clock Makers				1		1		1				3	5	10	4		2	3	5	1	6
Coach Lamp Mak.		1										1									
Coachmen			2	5	3	1						11	9	6	10	6	5	5	4	7	2
Coal Dealers						1	1					2	1	2	3			1	2		2
Comb Makers								1				1		1		1	1		1		
Conductors		1										1	2	5	1	6	1	3	1	1	2
Confectioners				1								1		1	2		2	1		1	1
Contractors		1	1	1	3	2	1	1			1	11	5	13	5	3	1	6	3	2	3
Cooks		1	3	3	6	4	1					18	7	19	6	9	6	6	13	18	8
Coopers			1					1				2	6	7	4	2	3	8	5	2	2
Coppersmiths						1						1					1				
Corset Makers	1	2	1									4	8	9	3	1	5	2	3		5
Cutlers		1				1	1					3	3	6	8	3	8	3	7	6	6
Dentists		3				1		1				5	3	2	2	3	6		3	4	4
Detectives					1							1									
Die Sinkers				1								1	2	1	1			2	1	3	2
Distillers							1					1		1				1	1		
Domestics	6	29	16	10	17	12	10	5	2	1		108	102	73	48	112	106	60	47	39	61
Dressmakers		3	5	2	2	1	3		1			17	15	29	20	19	21	19	14	12	17
Drivers	1	2	3	1	2		1	1				11		4	1	2					
Druggists	2	1	1	2		2	1					9	10	14	6	6	5	5	12	2	4
Dyers			2		2	1	1	2				8	4	3	2	3	7	7	7	4	2
Electricians			1									1					1	1			
Engineers		1	4	4	2	2	1	1				15	23	21	19	13	16	13	20	4	16
Engravers			1			1						2		1	1	3	1	1	1	5	2
Expressmen			1	2		1						4	7	5	2	2	9	4	2		8
Factory Hands	13	24	14	13	7	1	2					74	86	6	20	18	24	12			
Farmers	20	34	37	51	77	181	250	174	22			846	831	770	772	712	763	694	697	768	789
File Cutters						1						1				1					2
Firemen			2		1							3	1	3	2	1	2	2	1	1	2
Fishermen			1	1	1		1					4	7	3	6	7	4	6	6	8	3
Florists	1							1				2	1	1				1	2		
Foremen		1		2	2	1		1				7		7		4	3	1	8		3
Freight Agents						1						1									
Furriers						1						1	15	4	2	2	1				
Gardeners		1	1	2	3	6	3	1				17	14	13	20	16	12	13	10	3	4
Gas Fitters		1			1							2		1	1						
Gas Makers		1										1			1				1		2
Glass Cutters		1										1		1		2	1	1			
Grinders		3	5	4	1	1						14	17	7	11	7	8	10	7	5	2
Grocers			1			1						2	7	12	4	6	3	7	6	7	3
Gunsmiths					2	1	1					4	3	4	3	4	1		4		4
Hackmen			1									1			3	2	2	1	2		2
Harness Makers			1	1		3	2	1				8	6	15	8	6	12	3	6	7	7
Hatters	1	7	7	8	1	2	3					29	48	53	43	27	29	18	19	28	50

TABLE XII.—CONTINUED.

OCCUPATIONS.	15 to 20.	20 to 30.	30 to 40.	40 to 50.	50 to 60.	60 to 70.	70 to 80.	80 to 90.	90 to 100.	Over 100.	Age not stated.	Total, 1890.	Total, 1889.	Total, 1888.	Total, 1887.	Total, 1886.	Total, 1885.	Total, 1884.	Total, 1883.	Total, 1882.	Total, 1881.
Hat Trimmers	1	2	1		2							6	2	3	2	2	4	1			
Hostlers	1	1	7	1	4	1						15	18	16	5	12	5	2	4	2	4
Hotel Clerks			1	1								2	1	1	1	1					
Keepers		1	2	1	5	1	1	1				12	6	12	7	13	9	13	11	10	15
Housewives	19	223	222	230	276	334	360	238	69			1971	1699	1676	1523	1608	1602	1689	1664	1614	1717
Insurance Agents			1	1	1		1					4	3	13	1	4	7	5	2		5
Iron Moulders		1	1		1	1	1					5									
Jailors							1					1									
Janitors		2		3	1	1	2	1				10	4	6	5	6	1	5	1		
Japanners		1										1	1		3	1				3	1
Journalists						1						1	1	1	2	1				5	
Judges						2						2				1		1			
Laborers	32	117	93	114	80	101	66	23	10			636	594	692	561	481	501	527	536	545	511
Lathers					1	1						2		2	1			2			
Laundrymen			1									1			1	1					
Laundresses		2	1		2							5	6	3	2			3	2	2	
Lawyers			2	2	2	2	1	1				10	14	21	21	10	9	12	15	7	10
Liquor Dealers		2	1		1		1					5	1	4		2	5	3	4		4
Liverymen		1	1		1	2	1					6	8	9	12	5	3	3	6	3	5
Locksmiths	1	1	1	2	1	1		1				8	4	8	4	2	2		8	7	8
Machinists	2	15	19	8	12	9	5	3				73	54	61	48	42	59	46	52	20	31
Manufacturers	1	2	7	4	7	9	4	3				37	33	31	44	26	33	30	27	28	34
Mariners			1	2		1	3	2				9	33	20		12			27		24
Masons		3	4	7	7	9	6	3				38	36	43	41	37	42	24	45		22
Mechanics	12	26	25	19	27	29	24	7	2			171	133	158	138	132	160	191	195	318	325
Merchants		3	14	27	22	29	22	12	1			130	91	117	111	114	99	114	148	131	147
Messengers	1					1						2			1						
Millers				1	1	3	2					7	5	5	6	6	4	7	11	5	6
Mill Hands	20	31	14	12	11	8	5	1			2	104	67	110	88	79	67	88			
Milliners					1							1	4	4	2	2	4	2	4	5	6
Millwrights							1	1				2	1	2	2	1	2	2			
Miners				3		1						4	4	3	1	5		3			
Moulders		7	22	10	11	4	2					56	40	45	40	38	29	27	41	28	24
Musicians		2			1	2						5	8	5	4	4	1				
Nurses		1	3		3	1	2	3				13	17	13	8	15	16	18	14	13	15
Opticians			1									1	1		2			3			
Organ Makers		2										2	1								
Overseers			1									1		2	5	1	2	1	1	1	2
Oystermen						2						2	2	5	6	5	7	4	6	2	3
Painters	1	3	11	7	14	7	6					49	49	30	52	46	53	44	40	28	39
Paper Box Makers		2		1	1	4			1			9	1						3		
Pattern Makers		1		1		1						3	4	6	3	2	1	2	3	3	2
Peddlers			2	2	2	2	2					10	10	10	10	9	11	5	10	7	3
Photographers			1	1	1	1						4	3	5	3	1	2				
Physicians		3	5	4	4	4	2	3				25	20	23	22	27	16	21	19	16	25
Piano Makers							1					1	3		4						
Tuners					1							1		1				1			
Pistol Makers						1						1				2		1			
Plasterers				1	1							2		2	1	1		1			

TABLE XII.—Continued.

OCCUPATIONS.	15 to 20.	20 to 30.	30 to 40.	40 to 50.	50 to 60.	60 to 70.	70 to 80.	80 to 90.	90 to 100.	Over 100.	Age not stated.	Total, 1890.	Total, 1889.	Total, 1888.	Total, 1887.	Total, 1886.	Total, 1885.	Total, 1884.	Total, 1883.	Total, 1882.	Total, 1881.
Plumbers		4	4			1						9	9	12	3	7	4	8	7	5	3
Policemen			2	2	1							5	2	2			1	1	1	3	3
Polishers	1	7	2	1	1							12	15	7	8	13	3	5	8	3	11
Porters			2			1						3	3	5	3	2	4	1			
Priests			1		1							2				2		1	2		
Printers	3	7	4	2	1	1						18	13	22	14	10	14	12		8	10
Prisoners		7	1									8				16	10				
Publishers								1				1			1			3	1		1
Quarrymen				1	1	1	1					4	8	13	14	9	10	12	19	16	6
Railroad Employee		10	3	1								14	8	9	16	5	4	4	14	7	8
Ticket Agents							1					1		1	1						
Real Estate Agents				1	1	2	2		1			7	1	4	4	1		4			
Retired Merchants				1	1	1	2	5				10		6	7	8	9	15	6	11	6
Rubber Workers	5	11	3	4	1	4						28	10	15	9	8	2	4	3		
Saddlers							1					1	1	1		2	3		1		4
Sail Makers						1						1	1	2				2		2	4
Salesmen	1	5	3	5	1	3						18	6	4	6	8	6	4	1		3
Saloon Keepers		4	5	4	2							15	20	23	15	23	18	18	19	21	19
Sea Captains					2	1	3					6	4	8	9	6	7	6	4	4	2
Seamen	1	3	4	2	2	2	4	2				20		16	29	24	34	37	21	29	16
Seamstresses		1			2	2						5	5	7	7	6	9	6	12	10	8
Sextons							1					1	2				2				1
Ship Builders	1					1		1				3	2	1	1	2	2	1	5	4	2
Carpenters				1			1					2	4	2	4	7	3	3	4		
Masters				1	1		1					3									
Shipping Clerks	1	2										3	1			3	2				
Shirt Manufacturer			2				1					3	1	7		2					
Shoe Cutters					1		1					2									
Makers		3		7	4	12	15	8	1			50	50	47	40	39	43	56	49	36	58
Silk Weavers					1							1	2								
Silver Platers		1				1						2	1	2			2	2			
Silversmiths			1	2			1					4	1			2	2	1			
Spinners						1						1	1	6	4	2	2		6		4
Spoon Makers			1	1								2	2	1				1			
Spring Makers				2								2	2	1	2		1		2		
Stenographers	1	1										2	1								
Stone Cutters		2	4	3	5	5	4	1	1			25	19	22	19	15	15	19	14	10	15
Stove Makers					1							1				1	6				
Students	20	6	1									27	25	11	18	31	24	14	14	12	20
Superintendents			1	2	1	2	2					8	1		5	3	5	3	2		2
Surveyors							1					1	1			2		1	1		1
Switchmen		1										1	4	3	2			1	1	1	2
Switch Tenders			1									1									
Tailors, Tailoresses	1	4	2	5	5	6	2	1				26	16	32	20	25	16	28	30	15	20
Tanners							1	1				2	2	5		2	3	3	2	1	5
Teachers	3	2	2	4	1	2		1	1			16	28	17	30	19	32	20	18	29	28
Teamsters		8	10	14	9	4	1					46	19	31	22	14	14	16	21	17	22
Teleg. Operators		4	1									5				1	1	1	5	2	1
Tinsmiths	1	2	1	1	2	1	1					9	7	8	4	1	3	10	6	7	11

TABLE XII.—CONTINUED.

OCCUPATIONS.	15 to 20.	20 to 30.	30 to 40.	40 to 50.	50 to 60.	60 to 70.	70 to 80.	80 to 90.	90 to 100.	Over 100.	Age not stated.	Total, 1890.	Total, 1889.	Total, 1888.	Total, 1887.	Total, 1886.	Total, 1885.	Total, 1884.	Total, 1883.	Total, 1882.	Total, 1881.
Tool Makers	1		1	1								3	6	3	1	1	2	3	4	2	2
Trackmen						1						1									
Trav. Salesmen			2		1							3		9	4	3	6	6	4	4	5
Undertakers		1		1								2	6		3	3	4	4	3		3
Upholsterers		1	1									2	2	1	2		2	2	1	1	1
Varnishers		2				1						3	1	3		3	1				
Waiters	1	4	2		1							8	10	7	7	4	5	6	9		6
Watchmen		2	2	2	5	4		1				16	6	9	13	6	8	8	7		6
Watchmakers		3										3	1	2	2	2	1				
Weavers	2	6		2	1	3	1					15	19	18	16	23	21	24	29	18	24
Wheelwrights							1	2				3	6	3	5	6	4	2	3	2	2
Wire Drawers				1		2						3	3	4	2	3	3	3	5	1	3
Wood Carvers						1						1	1	5							
Turners				2								2		2	2	3	1	1		6	
Wool Dealers							1					1									
Sorters						1						1	1			1		2	2	3	

TABLE XIII.

VITAL STATISTICS OF THE COLORED POPULATION BY COUNTIES.

COUNTIES.	Population.	BIRTHS.														MARRIAGES.											DEATHS.													
		Male.	Female.	Sex not stated.	Total, 1890.	1889.	1888.	1887.	1886.	1885.	1884.	1883.	1882.	1881.	Average.	1890.	1889.	1888.	1887.	1886.	1885.	1884.	1883.	1882.	1881.	Average.	Male.	Female.	Sex not stated.	Total, 1890.	1889.	1888.	1887.	1886.	1885.	1884.	1883.	1882.	1881.	Average.
Hartford	147,180	25	21	2	48	68	60	61	62	57	52	47	73	65	50.3	24	29	24	26	32	28	12	12	18	16	22.1	35	21	..	56	66	51	55	50	62	58	56	59	64	57.7
New Haven ..	209,058	28	35	..	63	115	104	80	98	75	111	92	88	72	89.8	41	38	41	24	51	36	43	52	42	5	37.3	72	60	1	133	114	111	80	117	67	101	110	83	104	102.0
New London .	76,634	22	15	..	37	32	33	35	26	32	31	40	38	30	33.4	23	14	12	13	20	22	8	15	11	16	15.4	18	16	..	34	36	35	29	28	30	48	47	39	35	36.1
Fairfield	150,081	22	28	..	50	58	50	43	55	41	46	55	39	39	47.6	23	16	26	26	18	18	16	18	12	15	18.8	30	32	..	62	66	56	74	66	52	53	41	45	52	56.7
Windham.....	45,158	3	8	..	11	12	11	13	14	10	9	9	7	13	10.9	1	9	4	3	4	4	..	6	3	12	4.6	3	5	..	8	12	12	9	10	14	19	11	..	9	10.4
Litchfield.....	53,542	6	4	..	10	23	9	21	15	21	15	18	23	23	17.8	10	7	5	5	5	8	4	8	4	4	6.0	14	15	..	29	16	20	28	15	13	9	16	16	17	17.9
Middlesex	39,524	4	...	..	4	10	8	9	4	10	12	8	6	7	7.8	2	3	4	1	3	....	2	4	5	1	2.5	9	5	..	14	4	15	11	7	6	12	12	6	6	9.3
Tolland	25,081	1	1	..	2	4	8	2	6	4	4	3	9	6	4.8	2	...	...	2	6	2	..	2	3	1	1.8	6	1	..	7	1	6	...	1	8	6	3	6	1	3.4
Total........	746,258	111	112	2	225	322	283	264	280	250	280	272	283	255	271.4	126	116	116	100	139	118	85	117	98	70	108.5	187	155	1	343	315	306	286	294	247	306	296	254	288	293.5

NOTE.—In addition to the above there were in 1890 eight (8) mixed marriages, in 1889 six (6) mixed marriages, in 1888 eight (8) mixed marriages, in 1887 three (3) mixed marriages, in 1885 six (6) mixed marriages.

TABLE XIV.

DEATHS FROM MALARIAL* FEVERS IN EACH TOWN, BY COUNTIES, CONTRASTED WITH THOSE FROM TYPHOID FEVER FOR A SERIES OF YEARS.

HARTFORD COUNTY.

TOWNS.	Population by Census.	1890.		1889.		1888.		1887.		1886.		1885.		1884.		1883.		1882.		1881.		1880.		1879.		1878.		1877.		Typhoid Fever				
		Malarial.	Typhoid.	Malarial.	Typhoid.	Malarial.	Typhoid.	Malarial.	Typhoid.	Malarial.	Typhoid.	Malarial.	Typhoid.	Malarial.	Typhoid.	Malarial.	Typhoid.	Malarial.	Typhoid.	Malarial.	Typhoid.	Malarial.	Typhoid.	Malarial.	Typhoid.	Malarial.	Typhoid.	Malarial.	Typhoid.	1876.	1875.	1874.	1873.	1872.
Hartford	53,230	5	30	3	26	4	26	2	8	7	21	9	21	...	28	3	12	4	30	12	27	24	13	3	11	2	22	...	22	26	35	14	29	33
Avon	1,182										1		1				1		1						1		1		1	..	1	3	1	5
Berlin	2,600	1		3	1	2		1			2			4		2								1	1				1	..	2	..	1	4
Bloomfield	1,308		1										1						2	1					1					2	1	3	3	2
Bristol	7,382		5		4	1	4		4				1		4		3	1	7		7	2	4		1	1	3		4	15	4	9	6	8
Burlington	1,302								1		1		1	1	2		2		2	1							2			2	..	..	3	1
Canton	2,500				2		1		1		4		4		2				7						8				4	..	1	2	1	2
East Granby	661										1									2									1	..	..	1	..	..
East Hartford	4,455	1			1	2	1	2	4		1	1			1	1	2	3	3	2		5		2	3		4	4	1	3	1	2	2	2
East Windsor	2,890							2					1				3	1	2		1		1				1		1	..	1	3	4	1
Enfield	7,199	1	3		5		3	2		1	3	3	5		4		1	1		2			4				1		2	5	2	2	3	5
Farmington	3,179		1		2	1		1					1		5		4	1									2		2	3	5	..	..	1
Glastonbury	3,457		3			1	5	1	1	1		1	7		1	1		1			2		1			1			1	3	4	4	12	3
Granby	1,261								1		1		1			1	1	1				1		1					1	2	2	3	2	2
Hartland	565						1									1				1	1									..	..	1	..	2
Manchester	8,222	3	2		1	2	1	7	1	3		5		10	2	1	4		2		6	1	5	1	1			1	1	2	1	6	3	5
Marlborough	582																						2							..	1	..	1	1
New Britain	19,007	1	15	1	10	1	15		8		7		4		5		7	3	1		4	4	1	6	1	2	2		7	8	16	7	7	18
Newington	953																			2										..	..	..	..	..
Plainville	1,993			1			2				1	2	3											1					2	1	1	1	2	1
Rocky Hill	1,069		1								1		4		2	1	1					1				1				1	..	..	1	5
Simsbury	1,874		1	1			1				2		1		1		1		1	1	1				1	1	1		1	2	3	..	1	2
Southington	5,501	1	2	5	1	1	3	3	1			4	3	1		1	2			2		1	3	2					1	3	12	1	3	8
South Windsor	1,736				1		2				1		1			1					1		2							2	3	..	1	1
Suffield	3,169				2		2		1		1		3		1		4	1	3			3	2					1	5	..	3	1	6	5
West Hartford	1,930										1		2			1			2		1					1			1	..	2	2	2	..
Wethersfield	2,279			1			5	1	2					1					1		1		1	3	1	3			1	2	..	1	4	6
Windsor	2,954				3		2				1		1		1					1			1						3	1	1	1	3	1
Windsor Locks	2,758				3	1	1							1	2		1	2						1		1				5	1	1	1	..

* Malarial is used for all the varieties—Intermittent, Remittent, etc., except Typho-Malarial.

TABLE XIV.—CONTINUED. NEW HAVEN COUNTY.

TOWNS.	Population by Census.	1890.		1889.		1888.		1887.		1886.		1885.		1884.		1883.		1882.		1881.		1880.		1879.		1878.		1877.		Typhoid Fever				
		Malarial.	Typhoid.	Malarial.	Typhoid.	Malarial.	Typhoid.	Malarial.	Typhoid.	Malarial.	Typhoid.	Malarial.	Typhoid.	Malarial.	Typhoid.	Malarial.	Typhoid.	Malarial.	Typhoid.	Malarial.	Typhoid.	Malarial.	Typhoid.	Malarial.	Typhoid.	Malarial.	Typhoid.	Malarial.	Typhoid.	1876.	1875.	1874.	1873.	1872.
New Haven	86,045	12	24	17	24	22	38	13	24	8	25	13	17	10	42	28	33	20	24	30	28	13	18	6	12	5	13	1	15	23	37	47	55	53
Ansonia	10.342		1		2																													
Beacon Falls	505													1																		2	2	1
Bethany	550								1						1																1	1	1	2
Branford	4,460		4		1	3	1				1	1		1	2		5				1		4	2		1	1		2	3	5	1	1	3
Cheshire	1,929	1	2		1						1					1	1				1							1	1	2		3	2	2
Derby	5,969	1	4	1	1	3	7		7	1	4	3	4		7	2	5	2	7	1	2	1	1		1	1	1	1	2	3	4	4	3	7
East Haven	955	1		1						1									2	3				2			1		2	2	1	1		3
Guilford	2,780			1			4						1		1		1				1			1	1	1	3		1	1		3	1	2
Hamden	3,882	1			1	1	3	3	1	1	1	2		1		2		1	2	1	2	1				1	1	3					2	2
Madison	1,429						11		1		1		3		2		1				1		2								1		3	1
Meriden	25,423	4	13	7	7	7		5	5	3	6	6	9	6	9	8	8	7	9	1	14	2	5	2	5	4	8	2	9	5	21	4	12	11
Middlebury	566																				2		2	1	1				1	2		1	1	
Milford	3,811		1	1	1		2				1	1		1	1		1	1			2	2	1			1				3		5	3	
Naugatuck	6,218	1	4		5		8	1		1	1		4		1		5		14				3				4		7		4	4	3	6
North Branford	825			1				1		2		1	1	1		1	1			1						1		1	1		4		1	1
North Haven	1,862	2			1	2			1		1	1			1		1	1		4			1	2		2		1		2	4			
Orange	4,537	1	1		1	1	2			1	3	1						1		2	1				3			1			3		1	
Oxford	902				1						1							1			2			1						2		1		2
Prospect	445					1					2																		1			1		
Seymour	3,300	1	3		2		3			1		1					1	1	1	5	2		3				4				2			3
Southbury	1,089		1														2		1			2			1	1			1	3			1	2
Wallingford	6,584	2	2	4	2	1	2	3	1		1	1	4		5	1	2	2	3	1	4	2	2		1	1	1		1	4	1		6	11
Waterbury	33,202	1	43	1	11	5	13	1	8		19	1	13	7	20	4	41	2	13		8		5	1			14		17	16	17	18	11	12
Wolcott	522				1		1		1		2										1								3	1	3			3
Woodbridge	926																		1								1		1	1		2	1	2

TABLE XIV.—Continued. New London County.

TOWNS.	Population by Census.	1890.		1889.		1888.		1887.		1886.		1885.		1884.		1883.		1882.		1881.		1880.		1879.		1878.		1877.		Typhoid Fever				
		Malarial.	Typhoid.	Malarial.	Typhoid.	Malarial.	Typhoid.	Malarial.	Typhoid.	Malarial.	Typhoid.	Malarial.	Typhoid.	Malarial.	Typhoid.	Malarial.	Typhoid.	Malarial.	Typhoid.	Malarial.	Typhoid.	Malarial.	Typhoid.	Malarial.	Typhoid.	Malarial.	Typhoid.	Malarial.	Typhoid.	1876.	1875.	1874.	1873.	1872.
New London	13,757		7	2	6	2	3	1	3	5	1	5	1	5			2	1	3	1	5		4		4		6		2	3	7	6	3	6
Bozrah	1,005				2												1		1						1					1				2
Colchester	2,988	1	2		1		3	1	1						1		4		5		3		1		2		2		1	1	1	2	2	4
East Lyme	2,048				1	1	1	1					2		1			1		1		2	2		3		2			2	1	1		1
Franklin	585				1																		1				•				3			1
Griswold	3,113			1	1	1	1				1	2	1		1	2	1		3	1	3		3						2	3	3	4	1	
Groton	5,539				1	1	2	1	2		1	2						1	4				5		5		1		3	6	1	3	4	5
Lebanon	1,670					1				1								1			2				1				1	1	1	2	1	3
Ledyard	1,183		2	1	1						1				1																2	1	2	1
Lisbon	548														1					2	1									1				
Lyme	977							3																								3	2	
Montville	2,344	1	1				1	1			1												2		1		1				4	3		1
Norwich	23,048		5	3	8		1	2	3		5	2	23		12		12	1	12	1	6	1	7	1	5		12		12	14	11	12	16	12
No. Stonington	1,463	2	1		1	1					1				1		2				2		1				1		1	1	4			
Old Lyme	1,319				1			2	1						1	2										1	1		1	2	1	3	1	1
Preston	2,555								1						2	1	1		1	1					1							1		
Salem	481																		2						1									
Sprague	1,106								1		1				1				1		1				6				1	4	3	4		
Stonington	7,184		2				3		2		1			1	1		2	2	3			1	5	1	5		3		1	3		3	4	1
Voluntown	1,060	1					1				1		1	1	1								1							1		2	3	
Waterford	2,661	2	4		2	1		3	1		1			1						1									1			1		2

TABLE XIV.—CONTINUED. FAIRFIELD COUNTY.

TOWNS.	Population by Census.	1890.		1889.		1888.		1887.		1886.		1885.		1884.		1883.		1882.		1881.		1880.		1879.		1878.		1877.		Typhoid Fever				
		Malarial.	Typhoid.	Malarial.	Typhoid.	Malarial.	Typhoid.	Malarial.	Typhoid.	Malarial.	Typhoid.	Malarial.	Typhoid.	Malarial.	Typhoid.	Malarial.	Typhoid.	Malarial.	Typhoid.	Malarial.	Typhoid.	Malarial.	Typhoid.	Malarial.	Typhoid.	Malarial.	Typhoid.	Malarial.	Typhoid.	1876.	1875.	1874.	1873.	1872.
Danbury	19,473		8		22	3	8	1	7		10	1	1		4		3		3		3	1	4		1		2		4	5	3		2	5
Bridgeport	48,866	7	3	22	8	11	8	8	17	2		9	12	5	11	5	2	3	9	5	13	4	10	4	11	4	9	5	7	5	10	6	16	27
Bethel	3,401		2	1	1		2				3		1				1	1			1	2	1				1			2		1		
Brookfield	889	1	2				1										3				1									1	1			
Darien	2,276					2												1					4	1		1			1	1		3	1	
Easton	1,001			3		1		1				1	1					1										1	2	1				3
Fairfield	3,868			1				1			2	1	2		1	5		1	2	2				4		1			3	3	2	5	1	2
Greenwich	10,131		5	1	3	3	4	3	1	2	2	2	4		1	2	3		1	1		2		1	3	3	2		1		1		1	1
Huntington	4,006	2	2	2	2		1	1	1		2		1				2				1		2				1	1	1	3		5	1	
Monroe	994							1				1																		1		2	1	1
New Canaan	2,701		2		1			1							2	1	3				3		3	3	1		1			1		1		2
New Fairfield	670		1									2			1														1					
Newtown	3,539			2	2	1		1		1		2	1						4		2	1	1		3		1						1	6
Norwalk	17,747	3	9	4	4	12	2	10	2	4	2	10	3	3	2	3	2	4	6	9	4	2	1	1	1	1	5	2	6	8	11	2	5	7
Redding	1,546				2	1					1	1			2														1				2	
Ridgefield	2,235								1						1						1													2
Sherman	668		1		1			1																2						2		1		2
Stamford	15,700	1	5		8	4	1	3	2	3	2	3	3	2		2	6	4	10	3	1	3	1	2	4		2	2	2	1	3		1	
Stratford	2,608			1	2	1	2	1	3		3		1		1	1	1				3					1			1				2	2
Trumbull	1,453				1									1								1	2						1	2	2	1	2	
Weston	772						1		1						1					1					2					1			1	3
Westport	3,715		1	1	9	1		3	1	2	2	1			1	1	1	1		1		2	3	1				2	1	4	6	1	3	5
Wilton	1,722		1		2		1	1	1		1		1		2		2								1		2	1				1	1	1

TABLE XIV.—CONTINUED. WINDHAM COUNTY.

TOWNS.	Population by Census.	1890. Malarial.	1890. Typhoid.	1889. Malarial.	1889. Typhoid.	1888. Malarial.	1888. Typhoid.	1887. Malarial.	1887. Typhoid.	1886 Malarial.	1886 Typhoid.	1885. Malarial.	1885. Typhoid.	1884. Malarial.	1884. Typhoid.	1883. Malarial.	1883. Typhoid.	1882. Malarial.	1882. Typhoid.	1881. Malarial.	1881. Typhoid.	1880. Malarial.	1880. Typhoid.	1879. Malarial.	1879. Typhoid.	1878. Malarial.	1878. Typhoid.	1877. Malarial.	1877. Typhoid.	Typhoid Fever 1876.	Typhoid Fever 1875.	Typhoid Fever 1874.	Typhoid Fever 1873.	Typhoid Fever 1872.
Brooklyn	2,628	...	...	...	1	1	2	...	1	...	1	...	1	...	2	...	2	...	3	...	1	4	2	...	...	...	2	...	...	1	4	1	..	..
Ashford	778	...	...	...	1	...	...	...	3	...	...	...	...	...	...	...	...	...	...	...	2	...	1	...	...	...	...	...	1	1	4	4	2	1
Canterbury	947	...	1	...	...	1	...	1	1	...	...	...	1	...	...	...	2	...	4	...	...	...	...	...	1	...	...	...	...	1	1	..	..	1
Chaplin	542	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	1	...	1	..	..	..	1	..
Eastford	561	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	1	1	...	...	...	1	...	...	...	...	...	1	..	..	4	1	..
Hampton	632	...	...	...	1	...	...	...	1	...	...	...	...	...	...	...	2	...	...	...	...	...	...	...	...	...	...	...	...	..	..	..	1	1
Killingly	7,027	...	2	...	4	1	8	...	4	...	17	...	6	...	6	...	5	...	13	...	7	...	13	...	2	...	7	...	6	4	1	5	8	13
Plainfield	4,582	...	2	...	1	1	5	4	...	...	1	3	1	...	3	...	1	1	6	...	7	...	3	...	3	...	...	...	...	5	3	8	2	3
Pomfret	1,471	...	...	...	1	...	...	...	1	...	...	...	1	...	...	...	...	...	1	...	2	...	2	...	1	...	...	...	2	1	2	1	..	..
Putnam	6,512	...	...	...	2	...	4	1	4	...	4	...	...	2	6	...	3	...	2	...	...	...	7	...	2	...	13	...	9	7	6	10	10	10
Scotland	506	...	1	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	..	..	..	..	..
Sterling	1,051	...	2	...	3	...	...	...	1	...	...	...	...	...	...	1	...	...	1	...	...	...	...	...	...	...	...	...	...	4	3	..	..	1
Thompson	5,580	1	...	...	4	2	3	...	1	...	...	...	...	3	1	...	...	...	...	...	...	...	...	...	4	...	1	...	2	6	6	2	1	..
Windham	10,032	4	8	...	1	3	5	...	2	3	6	2	8	1	7	1	13	1	4	...	7	1	3	...	3	...	3	...	4	1	2	1	..	2
Woodstock	2,309	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	2	...	1	...	...	...	1	2	4	1	2	7

TABLE XIV.—CONTINUED. LITCHFIELD COUNTY.

TOWNS.	Population by Census.	1890. Malarial.	1890. Typhoid.	1889. Malarial.	1889. Typhoid.	1888. Malarial.	1888. Typhoid.	1887. Malarial.	1887. Typhoid.	1886. Malarial.	1886. Typhoid.	1885. Malarial.	1885. Typhoid.	1884. Malarial.	1884. Typhoid.	1883. Malarial.	1883. Typhoid.	1882. Malarial.	1882. Typhoid.	1881. Malarial.	1881. Typhoid.	1880. Malarial.	1880. Typhoid.	1879. Malarial.	1879. Typhoid.	1878. Malarial.	1878. Typhoid.	1877. Malarial.	1877. Typhoid.	Typhoid Fever 1876.	1875.	1874.	1873.	1872.
Litchfield	3,304	1						1			1		1	1		1			2								6		3	3	2	1	4	
Barkhamsted	1,130								1								1		1											1	2	2		1
Bethlehem	543										1				1									1							2			2
Bridgewater	617										1		1		1							1	3								1	3	2	2
Canaan	970				1																			1						2		1		3
Colebrook	1,098		1						1		2																		1	2			1	2
Cornwall	1,283				1								2				1		2										1	1	8	2		3
Goshen	972		1																1		1						2						1	
Harwinton	943				1						2				1		2														3	1	2	2
Kent	1,383			2									1	1			1		1		1	3	1	2			1		1	3	2		2	
Morris	584														1				1										1				3	
New Hartford	3,160		6		1		4		2		2		1		2		1		2		1	1	1		1	1	1		3	1			2	3
New Milford	3,917		2		2		3	3	1	1	3	2	2	4	1	1	2	1	4		2	1	5	2	4		2		4	3	1	6	3	3
Norfolk	1,546				1		1						1						1		1								1	2	2	2	1	1
North Canaan	1,683		2		4		3				1	1								1	3		1	1							2	2		1
Plymouth	2,147				1				1		1		1		1				2				1		1		2			3		1	6	6
Roxbury	936		3				1								1		1				1						1			1		2	1	1
Salisbury	3,420			1	1							1			1		3		3		3		3	1	2	1	1			3	2		2	
Sharon	2,149				2								2						1				2		1		4		5	2	1	3	4	
Thomaston	3,278				1	1	4							1		2	1	1	1						1				2	1				
Torrington	6,048	1	1		3		1		6				1			4	1		3	1	2			2	2		3		1	4	6	3	3	4
Warren	477				1		2				1																					4		3
Washington	1,633		1				1		1		2	2	3						1											1		2		1
Watertown	2,323		2	1			1				1	1	1		1		1		1												1			2
Winchester	6,183	1							1		2		2			1			2				3	1	3	1	1		1	1	4	3		
Woodbury	1,815		2		1						1						3						1	1			3					2	2	4

TABLE XIV.—CONTINUED. MIDDLESEX COUNTY.

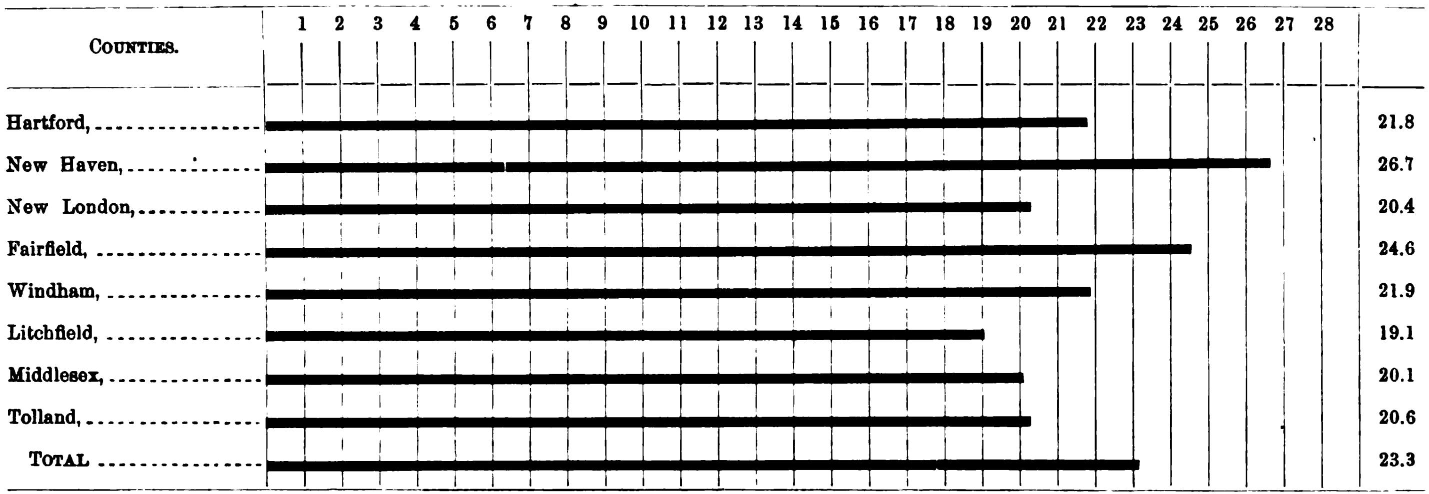
TOWNS.	Population by Census.	1890.		1889.		1888.		1887.		1886.		1885.		1884.		1883.		1882.		1881.		1880.		1879.		1878.		1877.		Typhoid Fever				
		Malarial.	Typhoid.	Malarial.	Typhoid.	Malarial.	Typhoid.	Malarial.	Typhoid.	Malarial.	Typhoid.	Malarial.	Typhoid.	Malarial.	Typhoid.	Malarial.	Typhoid.	Malarial.	Typhoid.	Malarial.	Typhoid.	Malarial.	Typhoid.	Malarial.	Typhoid.	Malarial.	Typhoid.	Malarial.	Typhoid.	1876.	1875.	1874.	1873.	1872.
Middletown	15,205	1	21	2		1	4	2	1	2	1	4		2	6	3	2	3	2	8	5	4	6		2	2	1		3	4	8	7	5	13
Haddam	2,095			2	1	2	3	1	4		1							1	1		6		2	1		1			1		3		2	1
Chatham	1,949		3								3		2		1		1	1	1		1		2		1		2				1	2	3	4
Chester	1,301	1			1										1	1		2	1							1					2	1	1	2
Clinton	1,384	3	1	1			1	2		1	1		1			1	2			1			2						1	3	1	3	3	
Cromwell	1,987		4		1				1		2				1					1			1			1	3				2	1	1	2
Durham	856		1		1		1	1	1		1		2	2	1		2		2	1			1				2							
East Haddam	2,599	1				5		1				3			1	2		1	2	1	1	1	2	1		1	3		3		6	3	5	3
Essex	2,035												1		1	1			3		1					1	1			1	2	2		
Killingworth	582																3	1	1	1					1	2			2				1	2
Middlefield	1,002						1									1			1	1												1		
Old Saybrook	1,484	1											1					1	1	3	1		1	1		2			2	1	1	3		2
Portland	4,687	2	1	1	2	3	5	4	5		4	8	1		3	1	2	1	6	3		1	2	1			4		3	2	3	5	3	5
Saybrook	1,484			1												2	1	2	1			3	1			1	1			2	1	1		
Westbrook	874					1									1		1		2		3				1		2							

TABLE XIV.—CONTINUED. TOLLAND COUNTY.

TOWNS.	Population by Census.	1890.		1889.		1888.		1887.		1886.		1885.		1884.		1883.		1882.		1881.		1880.		1879.		1878.		1877.		Typhoid Fever				
		Malarial.	Typhoid.	Malarial.	Typhoid.	Malarial.	Typhoid.	Malarial.	Typhoid.	Malarial.	Typhoid.	Malarial.	Typhoid.	Malarial.	Typhoid.	Malarial.	Typhoid.	Malarial.	Typhoid.	Malarial.	Typhoid.	Malarial.	Typhoid.	Malarial.	Typhoid.	Malarial.	Typhoid.	Malarial.	Typhoid.	1876.	1875.	1874.	1873.	1872.
Tolland	1,037				1				2				1				1	1	2		1									1		2	1	
Andover	401				2										1				1		1	1					1			1			1	2
Bolton	452						1								1	1			1								1		1	1	1	1		
Columbia	740		1	1																	1										1	1		1
Coventry	1,875				2				1		1				2		3		3				2						1	3	3	6		
Ellington	1,539						1				1										2						1						1	
Hebron	1,039		1			2	1				1			1			1		1		1		1		1					1		1		1
Mansfield	1,911						1		1		1		2		2		2		2				3		1				2	2	5	2	4	4
Somers	1,407		1				1										1	1	2								1				2			3
Stafford	4,535		7		4		1		2				1		7		4		7		3	1	3		2		1		3	3				2
Union	431			1							6		1			2	1				1				2		1		1	1	1	1	1	2
Vernon	8,808			1	5		3		7				2		3	1	7		5		5		6	1	4		7		10	5	12	8	11	9
Willington	906				2		2		1		2												2		1		2			1				

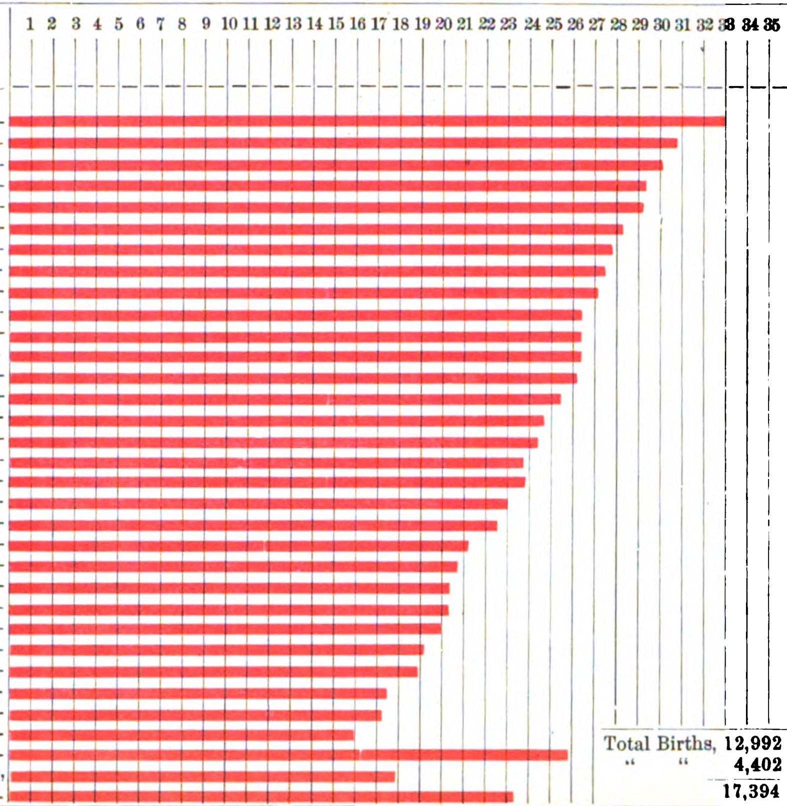
BIRTH RATE.

DIAGRAM A SHOWING THE NUMBER OF BIRTHS TO EACH 1000 OF THE POPULATION IN EACH COUNTY IN CONNECTICUT.



BIRTH RATE.

DIAGRAM B SHOWING THE RATE OF BIRTHS TO EACH 1000 OF THE POPULATION IN EVERY TOWN OF OVER 5000 INHABITANTS IN CONNECTICUT, AND OF THE REMAINDER OF THE STATE.



	Towns.	Birth Rate.
1	Ansonia,	33.0
2	Putnam,	31.0
3	Bridgeport,	30.4
4	Waterbury,	29.5
5	New Britain,	29.4
6	New Haven,	28.2
7	Meriden	27.9
8	Naugatuck,	27.6
9	Derby,	27.4
10	Danbury,	26.6
11	Vernon,	26.5
12	Wallingford,	26.5
13	Stamford,	26.3
14	Killingly,	25.4
15	New London,	24.7
16	Manchester,	24.5
17	Norwalk,	23.8
18	Norwich,	23.8
19	Hartford,	23.1
20	Enfield,	22.6
21	Bristol,	21.1
22	Torrington,	20.9
23	Middletown,	20.6
24	Windham,	20.5
25	Thompson,	20.0
26	Groton,	19.1
27	Stonington,	18·9
28	Greenwich,	17.5
29	Southington,	17.2
30	Winchester,	16.0
	Aggregate Population of above towns,	25.9
	" " " remainder of the State,	17.9
	" " " the whole State,	23.3

BIRTHS.

There were registered during the year 1890, in the State of Connecticut, 17,394 births, of which 16,745 were born alive and 649 were still-born. As compared with the year before there were 221 more living births, and three less still-births. Of the whole number of births of which the sex was certified, 8,877 were males and 8,409 were females, while in regard to 108 the sex was not stated.

The birth-rate is almost the same as in the year before, being 23.3 in a 1000 of the population. The previous year it was 23.4.

There was more uniformity in the birth-rate in the different counties in 1890 than in 1889. As usual, however, the counties of largest population have the highest birth-rate. The exception is in New London County, whose birth-rate is slightly exceeded by the less populous counties of Windham and Tolland.

The county giving the highest birth-rate in the State is New Haven, and the lowest birth-rate was in Litchfield County.

The relation of birth-rate to population has been practically the same for a number of years. But it would be misleading to accept mere number of population as the controlling factor. A closer examination of the registration shows that the character of the population as to nationality has a potent influence in determining the birth-rate.

It will be observed from the following statement that in respect to parentage those counties in which the proportion of births from foreign born parents is large have also the largest birth-rates generally.

Thus New Haven County has the largest birth-rate and over 58 per cent. of the children have one or both parents of foreign birth. This percentage is probably too small, for in 396 births the parentage in New Haven County is not stated, and it is the more remarkable that 391 of these are in the town of New Haven. The Registrar says all of these 391 are taken from the parish records of the Roman Catholic churches, and without doubt 95 per cent. are children of foreign born parents, which would make the percentage in the county something over 64 instead of 58 per cent.

The county in which the birth-rate is lowest, viz.: Litchfield, has only 35.4 per cent of its births of foreign parents.

Of Hartford County 55.8 per cent. are of foreign born parents.

Of New London County 48.7 per cent. are of foreign born parents.

Of Fairfield County 50.9 per cent. are of foreign born parents.

Of Windham County 60.6 per cent. are of foreign born parents.

Of Middlesex County 52.5 per cent. are of foreign born parents.

Of Tolland County 52.8 per cent. are of foreign born parents.

Of the State only 43.7 per cent. are registered as born of parents both American.

Of 500 births or 2.8 per cent. of the whole number registered, the parentage is not stated.

Of the sexes registered the proportion of boys to girls was 105.5 boys to 100 girls, against 109.1 of the previous year.

The proportion of births to the whole population of the State as given by the census (viz: 746,258) was 1 to 42.9 of the people or 23.3 per 1000.

Of the four large towns having the highest birth-rate two are in New Haven County, namely, Ansonia, 33; Waterbury, 29.5. One in Fairfield County, namely, Bridgeport, 30.4; and one in Windham County, viz: Putnam, 31.

Among the small towns of less than 5,000 population the four having the highest birth-rate are Burlington, 34.5; Portland, 37.1; Thomaston, 28.4; and Wolcott, 26.8.

The town having the smallest registered birth-rate in the State is Hartland, 7. It was the smallest in the year before, and the smallest yet although double what it was then, only 3.5.

The average birth-rate of the towns of over 5,000 inhabitants is 25.9, while that of towns of smaller population is only 17.9.

The greatest number of births in any one month occurred in August, viz: 1,547. The smallest number in February, 1,312.

The largest number of males were born in August, viz: 788. The largest number of females were born in July, viz: 751.

In the 1st	quarter of the year	the birth-rate was	23.3.
2d	"	"	21.9.
3d	"	"	24.3.
4th	"	"	23.3.

The birth-rate in the State was 23.3.

In Hartford County the town having the highest birth-rate was Burlington, 34.5. Three years in succession it has been the ban-

ner town of Hartford County. Hartland had the lowest birth-rate, 7.

In New Haven County Ansonia had the largest infant class, the birth-rate was 33. Bethany had the lowest birth-rate, 7.2. But Beacon Falls lead the State in natural increase of population. The proportion of births to deaths was as 10 to 1.

In New London County the highest birth-rate was in New London town, 24.7. The lowest in Ledyard, 8.4.

In Fairfield County Bridgeport exceeded the other towns with a birth-rate of 30.4 Darien had the smallest, 8.7.

In Windham County Putnam took the honors, birth-rate 31; the lowest was in Chaplin, 7.3.

Litchfield County's highest was Thomaston, 28.4, and the lowest was Cornwall, 11.6.

In Middlesex County Portland surpassed all other towns in the State with a birth-rate of 37.1. Her lowest birth-rate was in Saybrook, 8.7.

In Tolland County, Vernon gave 26.5 for the highest, and Bolton 11 for the lowest.

As before stated the birth-rate for the State as registered was only 23.3 per 1000 of the population. The birth-rate in Massachusetts has averaged for the 39 years from 1851 to 1889 inclusive 26.3 per 1000. In Rhode Island the birth-rate for 20 years preceding 1890 averaged 24.1. Whether our birth-rate in Connecticut is in fact less than our sister States on the north and east, or whether their success in registration is better than ours is difficult to decide.

Still it is evident that the birth-rate in the New England States is much less than in Europe. In England and Wales the birth-rate in 1889 was 31.4; in Scotland 31.2; in Austria, 38.2; in Prussia, 37.8; and in Hungary the average for 15 years was 45.5. It will surprise many to know, however, that Ireland does not exceed Connecticut. For 17 years the average birth-rate in Ireland was 23.2. The birth-rate of Europe, exclusive of Russia, (1865–1883) was 35.4 to 1,000 of the living population; that of Russia for the same period was 49.4, and that of all Europe was 38.7.

We had no one town in Connecticut in 1890 whose birth-rate was as high as that of the average of all Europe.

TABLE XV.—SHOWING AMERICAN AND FOREIGN PARENTAGE OF BIRTHS, BY COUNTIES, 1890.

COUNTIES.	Parents.				Nativity of Parents not Stated.	Total.
	Both American	Both Foreign.	Father For.; Mother Am.	Father Am.; Mother For.		
Hartford	1362	1271	287	227	71	3218
New Haven	1956	2330	502	401	396	5585
New London	803	504	136	124	....	1567
Fairfield	1791	1332	298	250	21	3692
Windham	385	420	101	79	5	990
Litchfield	660	234	74	55	3	1026
Middlesex	398	276	76	47	....	797
Tolland	241	161	66	47	4	519
Total	7596	6528	1540	1230	500	17394

TABLE XVI.—SHOWING NATIVITY OF PARENTAGE AND PERCENTAGE.

Years.	American Parents.	Per cent.	Foreign Parents.	Per cent.	Foreign American.	Per cent.	Not stated.	Per cent.	Total Births.
1890	7,596	43.6	6,528	37.5	2,770	15.9	500	2.8	17,394
1889	7,831	45.5	6,361	37.0	2,621	15.2	363	2.1	17,176
1888	7,640	45.2	6,039	35.7	2,615	15.4	584	3.4	16,878
1887	7,551	45.5	5,735	34.5	2,541	15.3	756	4.5	16,583
1886	7,437	46.6	5,498	34.5	2,503	15.7	496	3.1	15,934
1885	7,245	46.7	5,023	32.4	2,660	17.2	568	3.7	15,496
1884	7,418	47.0	5,871	37.2	2,236	14.1	233	1.4	15,758
1883	7,216	45.5	6,110	38.5	2,198	13.9	332	2.1	15,856
1882	7,142	49.	5,431	36.	2,105	14.	260	1.	14,938
1881	6,734	46.	5,229	35.7	1,737	12.	916	6.3	14,616

From the foregoing tables it appears that of the children born in Connecticut in 1890, the nativity of whose parents is registered, only 43.7 per cent. were of American parentage. In 37.5 both parents were of foreign birth. In 15.9 per cent. one parent was American, and the other of foreign birth. In 2.8 per cent. of the births the nativity of the parents is not registered, but as a very large majority of these were taken from the parish records of the Roman Catholic Churches, where that item is not recorded, they are doubtless almost all of them of foreign parentage. The

table also shows a gradually lessening percentage of births of American parents during the last 10 years and a correspondingly increased per cent. of foreign parentage.

TABLE XVII.—ILLEGITIMATE BIRTHS BY MONTHS AND SEX, 1890.

	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	TOTAL.
Males	15	8	9	8	10	3	7	7	7	7	4	9	94
Females	4	7	2	12	7	5	3	4	9	5	7	5	70
Sex not stated												1	1
Total	19	15	11	20	17	8	10	11	16	12	11	15	165

There are many reasons for believing that the illegitimate birth record is very defective, and that the foregoing table is not a close approximation to the true number. Doubtless many such births are concealed and not registered at all—while in many other cases the fact of illegitimacy, for obvious reasons, is not mentioned in the certificates.

TABLE XVIII.—TWIN-BIRTHS AND TRIPLETS BY MONTHS AND SEX, 1890.

	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	TOTAL.
Males	18	5	7	6	12	14	7	17	13	12	7	11	129
Females	14	11	11	10	14	12	17	13	23	14	3	19	161
Sex not stated	2											2	4
Triplets { Males	3							1					4
Triplets { Females								2					2
Total	37	16	18	16	26	26	24	33	36	26	10	32	300

TABLE XIX.—PLURALITY BIRTHS, 1890. BY TOWNS.

(Included in Tables I, II, III.)

HARTFORD COUNTY.

Towns.	Sex.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Total.
Hartford	Males	--	1	--	--	2	2	--	--	--	--	2	--	7
	Females	--	1	--	--	2	4	--	--	--	--	--	--	7
Berlin	Males	--	--	--	--	--	--	--	--	1	--	--	--	1
	Females	--	--	--	--	--	--	--	--	1	--	--	--	1
Bloomfield	Males	--	--	--	--	2	--	--	--	--	--	--	--	2
Bristol	Females	--	--	--	--	4	--	--	--	--	--	--	--	4
	Sex not stated	--	--	--	--	--	--	--	--	--	--	--	2	2
Burlington	Males	--	--	--	--	--	2	--	--	--	--	--	--	2
Manchester	Females	--	2	--	--	--	--	--	--	--	--	--	--	2
New Britain	Males	3	--	--	--	--	--	--	--	--	--	2	--	5
	Females	1	--	--	2	--	--	--	--	4	--	--	--	7
	Males, Triplets	3	--	--	--	--	--	--	--	--	--	--	--	3
Rocky Hill	Males	2	--	--	--	--	--	--	--	--	--	--	--	2
	Females	--	--	--	--	--	--	2	--	--	--	--	--	2
Southington	Females	--	--	--	--	--	--	--	--	2	--	--	--	2
Wethersfield	Males	--	--	--	--	--	2	--	--	--	--	--	--	2
Total		9	4	--	2	10	10	2	--	8	--	4	2	51

NEW HAVEN COUNTY.

Towns.	Sex.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Total.
New Haven	Males	3	--	--	2	3	1	2	2	--	1	1	--	15
	Females	1	2	2	2	1	1	8	--	4	5	1	2	29
Ansonia	Males	--	--	--	--	--	--	1	2	--	--	--	2	5
	Females	--	--	--	--	--	--	1	--	--	--	--	--	1
Branford	Males	--	--	--	--	--	--	--	2	--	1	--	--	3
	Females	2	--	--	--	--	--	--	--	--	1	--	--	3
Derby	Males	--	--	--	--	--	1	--	--	--	--	--	2	3
	Females	--	--	--	--	--	1	--	--	--	--	--	--	1
Hamden	Males	--	--	--	--	1	--	--	--	--	--	--	--	1
	Females	--	--	--	--	1	--	--	--	--	--	--	--	1
Meriden	Males	--	2	--	--	--	--	--	1	1	2	--	--	6
	Females	--	--	2	--	--	--	--	1	1	2	--	--	6
North Branford	Males	--	--	--	--	--	--	--	--	--	--	--	1	1
	Females	--	--	--	--	--	--	--	--	--	--	--	1	1
Orange	Females	--	--	--	--	--	--	--	2	--	--	--	--	2
	Males	2	--	--	--	--	--	--	--	--	--	--	--	2
Southbury	Females	2	--	--	--	--	--	--	--	--	--	--	--	2
Wallingford	Males	1	--	1	2	--	--	--	2	--	1	--	--	7
	Females	1	--	1	--	--	--	--	--	--	1	--	--	3
Waterbury	Males	--	1	--	1	--	--	--	--	2	--	--	2	6
	Females	--	1	--	1	--	--	2	2	--	--	--	4	10
Wolcott	Males	--	--	--	--	--	--	--	--	--	2	--	--	2
Total		12	6	6	8	6	4	14	14	8	16	2	14	110

TABLE XIX.—CONTINUED. NEW LONDON COUNTY.

Towns.	Sex.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Total.
New London	Females			2	2									4
Montville	Males						1							1
	Females						1							1
Norwich	Males	2				2				1	2			7
	Females		2					2		3	2		2	11
Old Lyme	Males							1						1
	Females							1						1
Preston	Females									2				2
Voluntown	Males									1				1
	Females									1				1
Total		2	2	2	2	2	2	4		8	4		2	30

FAIRFIELD COUNTY.

Towns.	Sex.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Total.
Danbury	Males			2					2					4
	Females								2				2	4
Bridgeport	Males	5							2	2	2	2		13
	Females	5		2		2	2		2			2		15
Brookfield	Males												1	1
	Females												1	1
Huntington	Males									2				2
	Females				2					2				4
New Fairfield	Females									2				2
Norwalk	Males						1	2						3
	Females						1							1
	Sex not stated	2												2
Ridgefield	Males								1		1			2
	Females								1		1			2
Stamford	Males						2							2
	Females										2			2
	Males, Triplets								1					1
	Females, Triplets								2					2
Total		12		4	2	2	6	2	13	8	6	4	4	63

WINDHAM COUNTY.

Towns.	Sex.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Total.
Killingly	Females						2							2
Thompson	Females					2								2
Windham	Females			2										2
Total				2		2	2							6

TABLE XIX.—CONTINUED. LITCHFIELD COUNTY.

Towns.	Sex.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Total.
Kent	Females												2	2
Salisbury	Males					1								1
	Females					1								1
Thomaston	Males		1							2				3
	Females		1											1
Torrington	Males								1	1				2
	Females								1	1				2
Winchester	Females												2	2
Woodbury	Females								2					2
Total			2			2			4	4			4	16

MIDDLESEX COUNTY.

Towns.	Sex.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Total.
Middletown	Males							1						1
	Females		2					1						3
Cromwell	Males						2							2
Portland	Males					1			2				1	4
	Females					1							3	4
Total			2			2	2	2	2				4	14

TOLLAND COUNTY.

Towns.	Sex.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Total.
Hebron	Males												2	2
Stafford	Males			4										4
Vernon	Males				1									1
	Females	2			1									3
Total		2		4	2								2	10

TABLE XX.—PLURALITY BIRTHS, 1890. BY COUNTIES.

(Included in Tables I, II, III, IV.)

COUNTIES.	SEX.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Total.
Hartford	Males	8	1	--	--	4	6	--	--	1	--	4	--	24
	Females	1	3	--	2	6	4	2	--	7	--	--	--	25
	Not stated	--	--	--	--	--	--	--	--	--	--	--	2	2
	Total	9	4	--	2	10	10	2	--	8	--	4	2	51
New Haven	Males	6	3	1	5	4	2	3	9	3	7	1	7	51
	Females	6	3	5	3	2	2	11	5	5	9	1	7	59
	Not stated	--	--	--	--	--	--	--	--	--	--	--	--	---
	Total	12	6	6	8	6	4	14	14	8	16	2	14	110
New London	Males	2	--	--	--	2	1	1	--	2	2	--	--	10
	Females	--	2	2	2	--	1	3	--	6	2	--	2	20
	Not stated	--	--	--	--	--	--	--	--	--	--	--	--	---
	Total	2	2	2	2	2	2	4	--	8	4	--	2	30
Fairfield	Males	5	--	2	--	--	3	2	6	4	3	2	1	28
	Females	5	--	2	2	2	3	--	7	4	3	2	3	33
	Not stated	2	--	--	--	--	--	--	--	--	--	--	--	2
	Total	12	--	4	2	2	6	2	13	8	6	4	4	63
Windham	Males	--	--	--	--	--	--	--	--	--	--	--	--	---
	Females	--	--	2	--	2	2	--	--	--	--	--	--	6
	Not stated	--	--	--	--	--	--	--	--	--	--	--	--	---
	Total	--	--	2	--	2	2	--	--	--	--	--	--	6
Litchfield	Males	--	1	--	--	1	--	--	1	3	--	--	--	6
	Females	--	1	--	--	1	--	--	3	1	--	--	4	10
	Not stated	--	--	--	--	--	--	--	--	--	--	--	--	---
	Total	--	2	--	--	2	--	--	4	4	--	--	4	16
Middlesex	Males	--	--	--	--	1	2	1	2	--	--	--	1	7
	Females	--	2	--	--	1	--	1	--	--	--	--	3	7
	Not stated	--	--	--	--	--	--	--	--	--	--	--	--	---
	Total	--	2	--	--	2	2	2	2	--	--	--	4	14
Tolland	Males	--	--	4	1	--	--	--	--	--	--	--	2	7
	Females	2	--	--	1	--	--	--	--	--	--	--	--	3
	Not stated	--	--	--	--	--	--	--	--	--	--	--	--	---
	Total	2	--	4	2	--	--	--	--	--	--	--	2	10
	Grand Total	37	16	18	16	26	26	24	33	36	26	10	32	300

Twins and Illegitimate Births by Counties for past ten years, with the Sexes for 1890:

Table XXI.

COUNTIES.	1890.								1889.		1888.		1887.		1886.		1885.		1884.		1883.		1882.		1881.		Total for 10 Years.		Average for 10 Years.	
	Twins.				Illegitimate.																									
	Males.	Females.	Sex not stated.	Total.	Males.	Females.	Sex not stated.	Total.	Twins.	Illegitimate.	Twins.	Illegitimate.	Twins.	Illegitimate.	Twins.	Illegitimate.	Twins.	Illegitimate.	Twins.	Illegitimate.	Twins.	Illegitimate.	Twins.	Illegitimate.	Twins.	Illegitimate.	Twins.	Illegitimate.	Twins.	Illegitimate.
Hartford	24	25	2	†51	23	26	..	49	64	43	*76	34	74	27	64	44	55	38	45	34	38	42	†65	52	†35	33	567	394	56.7	39.4
New Haven	51	59	..	110	26	16	..	42	108	57	72	59	94	52	76	44	68	33	†86	47	130	39	68	39	40	41	852	453	85.2	45.3
New London	10	20	..	30	6	8	..	14	24	20	32	20	30	28	24	24	†35	23	†45	29	48	30	24	21	16	18	308	227	30.8	22.7
Fairfield	28	33	2	†63	20	7	..	27	62	23	†53	29	50	25	26	22	†51	21	55	29	†43	30	54	32	18	30	475	268	47.5	26.8
Windham	...	6	..	6	6	6	..	12	18	11	4	7	10	8	16	4	12	7	15	7	18	13	16	11	44	13	159	93	15.9	9.3
Litchfield	6	10	..	16	6	1	1	8	24	19	12	6	22	9	16	9	20	12	24	3	32	9	24	7	12	6	202	88	20.5	8.8
Middlesex	7	7	..	14	2	5	..	7	†27	13	†29	6	14	7	†9	4	16	8	18	9	16	13	20	6	16	3	179	76	17.9	7.5
Tolland	7	3	..	10	5	1	.	6	8	3	12	7	10	8	14	2	16	9	12	5	8	4	10	3	4	8	104	55	10.4	5.5
Total	133	163	4	300	94	70	1	165	335	189	290	168	304	164	245	151	273	151	300	163	333	180	281	171	185	152	2846	1654	284.6	165.4

* Includes two sets of triplets.

† Each includes one set of triplets.

The illegitimate births as registered seem to be very unequally distributed county wise. The following table exhibits the rate of illegitimate births to every 1000:

Hartford County,	15.2	to	1000 births.
New Haven "	7.5	"	"
New London "	8.9	"	"
Fairfield "	7.3	"	"
Windham "	12.1	"	"
Litchfield "	7.7	"	"
Middlesex "	8.8	"	"
Tolland "	11.5	"	"

As represented by the foregoing, some of the northern counties are put in an unfavorable light, morally speaking.

The above rates are not only for a single year, but quite similar rates have prevailed for the last 10 years.

TABLE XXII.—STILL-BIRTHS, 1890.

WHITE.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	TOTAL.
Male	33	26	44	26	30	25	20	37	33	27	26	34	361
Female	19	27	21	28	28	14	18	22	22	23	18	20	260
Sex not stated	2	---	---	---	---	1	2	---	---	2	2	2	11
COLORED.													
Male	3	1	---	---	---	---	2	---	1	---	---	1	8
Female	---	---	---	---	1	1	1	1	1	1	---	3	9
Sex not stated	---	---	---	---	---	---	---	---	---	---	---	---	---
Grand Total	57	54	65	54	59	41	43	60	57	53	46	60	649

The total number of still-births registered in the State was 649, which is one to every 25.8 of living births.

In 11 instances, all whites, the sex of the child was not registered; of the remaining 638 there were 369 males and 269 females, of which 8 males and 9 females were colored. This disproportion of the sexes was less than in the previous year.

The proportion of still-births among colored people is about double what it is among the whites.

It must be remembered that the registration of still-births is very defective, especially of such as occur in the early months of gestation.

TABLE XXIII.—SHOWING A NATIONALITY OF PARENTS BY COUNTIES.

COUNTIES.	American.	Irish.	English.	German.	Canadian.	Scotch.	Welsh.	French.	Spanish.	Italian.	Swiss.	Austrian.	Belgian.	Hungarian.	Prussian.	Bohemian.	Danish.	Swedish.	Polish.	Norwegian.	Finland.	Russian.	Portuguese.	Newfoundland.	Arabian.	American and Foreign.	Mixed Foreign.	Foreign not stated.	Not stated.
Hartford	1362	435	68	225	98	24		5		57	2	1			4		23	143	14	1		79		3		514	83	6	71
New Haven	1956	791	145	438	191	35	3	3	1	185	7	17		1	2		17	126	14		2	132			1	903	194	25	396
New London	803	162	38	51	119	18	8			5							2	21	2	1	2	18	11			260	46		
Fairfield	1791	440	86	240	31	22		3		67	6	92		52		13	19	84	5	5	1	16				548	150		21
Windham	385	30	9	4	338	12												12								180	15		5
Litchfield	660	67	35	29	30	10		7		4	4	2					2	14	6							129	23	1	3
Middlesex	398	78	14	34	4	9		1		4							1	104	3		1	4				123	19		
Tolland	241	18	15	72	35	1		1			1						2		1							113	15		4
Total, 1890	7596	2021	410	1093	846	131	11	20	1	322	20	112		53	6	13	66	504	45	7	6	249	11	3	1	2770	545	32	500
1889	7831	2034	384	1133	820	89	7	18		267	27	59	4	37	4	17	53	467	29	9	4	220	21			2619	535	115	363
1888	7640	2181	369	1044	818	103	6	25		200	13	25	1	32	1	4	41	388	23	7	8	136	8			2615	501	105	584
1887	7541	2157	344	1063	817	76	8	20		158	28	6	1	38	4	3	29	320	7	15	1	83	14			2541	437	116	756
1886	7441	2140	323	1028	781	87	7	45		112	19	8		15	2	6	40	260	15	11		55	15			2590	497	44	495
1885	7245	1773	350	985	744	74	2	15	1	78	16	7	2	14	3	7	30	237	17	5	2	31	17			2206	415		493
1884	7326	2729	377	958	714	72	8	25		99	11	3		5			22	186	6	11		41	8	3		2130	458	30	263
1883	7219	3035	362	899	798	66	6	62		48	20	8	1				17	207	6	4		47	13			2179	434	65	325
1882	7142	5682	336	877	693	43		34		29	6						6	129				9				2105	502		
1881	6734	2901	316	853	707	44		17		13	12						5	79								1737	328		

Table XXIV.—Birth-rate by Counties for 10 Years.

Counties.	Year.									
	1890.	1889.	1888.	1887.	1886.	1885.	1884.	1883.	1882.	1881.
Hartford	21.8	22.4	22.5	22.8	23.1	24.3	23.6	26.8	23.9	23.1
New Haven	26.7	27.7	26.3	26.3	25.6	25.7	27.2	31.7	28.8	27.8
New London	20.4	20.1	20.4	19.9	19.8	20.4	21.2	21.6	21.3	21.5
Fairfield	24.6	23.0	22.	23.2	21.9	21.9	20.9	24.9	23.8	22.0
Windham	21.9	21.8	18.9	20.6	20.9	21.3	20.3	26.1	24.6	23.9
Litchfield	19.1	18.8	16.3	18.3	17.1	18.9	18.9	20.1	18.2	19.8
Middlesex	20.1	20.7	18.6	20.1	19.4	20.4	21.5	19.3	19.0	19.7
Tolland	20.6	22.1	18.3	19.6	18.5	18.0	20.2	19.4	20.0	21.8
State of Connecticut	23.3	23.4	22.2	22.8	22.2	22.6	23.5	25.4	23.9	22.4

MARRIAGES.

There were 6,284 marriages registered during the year 1890, being 540 more than in 1889.

This is one marriage to every 119 of the living population, or a marriage rate of 8.4 per 1,000, or 16.8 persons to 1,000. This is a higher rate than last year when it was 7.8 or 15.6 persons to the 1,000.

TABLE XXV.—MARRIAGES.

BRIDES.	12–15.	15–20.	20–30.	30–40.	40–50.	50–60.	60–70.	70–80.	80–90.	Age not stated.	Total.
First Marriage	1	934	4,107	472	52	17	3	1	----	----	5,587
Second "	--	5	218	254	122	41	12	1	----	1	654
Third "	--	---	----	9	13	9	3	2	----	----	36
Fourth "	--	---	----	----	----	2	----	----	----	----	2
Fifth "	--	---	----	----	1	3	----	----	----	1	5
No. not stated	--	---	----	----	----	----	----	----	----	----	----
Total, 1890	1	939	4,325	735	188	72	18	4	----	2	6,284
1889	--	835	3,955	654	205	69	18	8	----	----	5,744
1888	1	897	4,144	627	191	82	25	----	----	2	5,969
1887	2	876	3,977	642	209	56	19	1	----	6	5,788
1886	1	840	2,791	604	185	58	21	9	----	3	5,512
1885	1	833	3,389	563	208	57	25	5	----	1	5,091
1884	1	868	3,418	619	173	78	21	4	----	212	5,394
1883	1	787	3,648	526	184	70	20	5	----	199	5,440
1882	2	719	3,447	546	162	67	21	2	----	----	5,049
1881	--	705	2,959	774	156	62	25	5	----	----	4,687
GROOMS.											
First Marriage	--	147	4,124	928	121	18	5	2	----	6	5,351
Second "	--	---	116	321	243	112	63	10	1	----	866
Third "	--	---	----	3	15	9	21	6	1	----	55
Fourth "	--	---	----	----	----	5	5	----	1	----	11
Fifth "	--	---	----	----	----	----	----	----	----	----	----
No. not stated	--	---	----	----	----	----	----	----	----	1	1
Total, 1890	--	147	4,240	1,252	379	144	94	18	3	7	6,284
1889	--	101	3,865	1,175	346	152	84	18	3	----	5,744
1888	--	115	4,129	1,142	311	163	73	14	3	19	5,969
1887	--	108	3,979	1,090	320	150	79	16	1	45	5,788
1886	--	108	3,764	1,059	316	149	75	29	----	12	5,512
1885	--	106	3,508	945	305	119	69	21	1	8	5,091
1884	--	92	3,054	1,355	274	151	79	24	1	364	5,394
1883	--	89	3,604	976	299	143	61	24	1	243	5,440
1882	--	77	3,464	771	293	139	68	24	3	----	5,049
1881	--	89	3,165	921	299	122	65	21	5	----	4,687

The increase was general throughout the State. In every county except Tolland there were more marriages than in the year before, and in Tolland County there were only two less.

The number of persons who were married in 1890 in each county were to every 1,000 of the population as follows :

Hartford County, 16.8 ; New Haven County, 18.2 ; New London County, 17.2 ; Fairfield County, 15.5 ; Windham County, 17 ; Litchfield County, 14.3 ; Middlesex County, 15.5 ; and Tolland County, 16.9.

First Marriages and Re-marriages.—The marriages of bachelors and spinsters constituted 87 per cent. of the total ; those of widowers and widows 13 per cent. Of every 100 men married in the year 14 were widowers ; and of every 100 women married 11 were widows, and 89 per cent. were spinsters.

Of the males married in the year 2.3 per cent. were boys under 20 years old.

Of the females under 20 there were 14.9 per cent. and of these 5 were already widows ; and 5 brides for the fifth time entered the matrimonial state.

Table XXV. exhibits more in detail the foregoing facts.

Table XXVI.—COMPARATIVE AGES OF AMERICAN AND FOREIGN-BORN MOTHERS.

NO. OF MOTHERS AT BIRTH OF—	American Mothers.						Totals.										Foreign Mothers.						Totals.										Total for Ten Years		Nationality and age not stated.
	15-18.	18-20.	20-30.	30-40.	40-50.	Age not stated.	1890.	1889.	1888.	1887.	1886.	1885.	1884.	1883.	1882.	1881.	15-18.	18-20.	20-30.	30-40.	40-50.	Age not stated.	1890.	1889.	1888.	1887.	1886.	1885.	1884.	1883.	1882.	1881.	American.	Foreign.	
1st child	141	384	1989	328	20	..	2862	2817	2885	2747	2705	2688	2727	2744	2541	2554	42	123	1416	187	6	1	1775	1779	1723	1461	1362	1389	1349	1316	1559	1263	27270	14976	1
2d "	12	77	1482	467	12	2	2052	2137	2003	1923	2049	1884	1919	2893	1762	1805	5	39	1198	258	3	..	1503	1438	1307	1296	1222	1027	1040	1043	815	940	20427	11631	....
3d "	1	11	844	492	27	..	1375	1429	1387	1433	1426	1294	1390	1225	1295	1128	..	1	750	385	10	..	1146	1100	1063	983	937	821	822	762	651	811	13382	9096	....
4th "	...	2	486	524	30	..	1042	971	918	972	942	899	834	806	860	839	1	4	492	484	28	..	1009	874	799	741	720	607	666	665	639	879	9083	7599	2
5th "	...	1	205	397	33	..	636	673	648	630	597	555	574	559	555	571	..	4	237	387	25	1	654	597	579	536	531	500	598	612	607	762	5998	5976	....
6th "	...	...	111	304	39	..	454	473	381	400	394	381	300	358	356	414	..	...	98	326	29	..	453	453	455	456	449	423	585	527	443	478	4001	4722	....
7th "	...	1	40	195	23	..	259	278	282	257	262	261	235	213	206	214	..	...	37	258	58	..	353	334	366	352	337	393	449	436	323	400	2467	3743	....
8th "	...	...	9	141	26	..	176	169	168	156	164	166	140	138	113	73	..	...	12	210	42	..	264	274	286	285	288	244	337	315	299	153	1463	2745	....
9th "	...	...	6	86	31	..	123	118	97	117	111	99	82	81	67	42	..	...	5	127	55	..	187	193	185	170	207	214	251	232	186	129	937	1954	....
10th "	...	...	....	36	22	..	58	80	68	55	55	48	50	46	28	27	..	...	1	97	50	1	149	116	134	178	134	110	135	146	139	94	515	1335	....
11th "	...	...	....	22	15	..	37	42	34	37	27	37	24	27	19	18	..	...	....	49	32	..	81	70	74	108	88	65	55	105	63	41	302	750	....
12th "	...	...	....	16	6	..	22	26	18	15	14	13	14	14	12	12	..	...	....	26	32	..	58	74	61	73	41	49	42	85	41	34	160	558	....
13th "	...	...	....	4	9	..	13	13	8	9	6	8	6	8	3	6	..	...	....	20	23	..	43	42	32	36	25	30	38	68	36	9	80	359	....
14th "	...	...	....	....	2	..	2	8	3	5	4	3	3	1	2	2	..	...	....	9	7	..	16	21	22	23	22	19	18	17	18	8	33	184	....
15th "	...	...	....	2	2	..	4	1	....	5	1	2	2	3	1	....	..	...	....	5	6	..	11	11	12	13	9	11	7	7	11	4	19	96	....
16th "	...	...	....	1	1	..	2	....	1	1	....	2	1	....	....	....	..	...	....	1	3	..	4	7	6	6	6	5	4	3	3	....	7	44	1
17th "	...	...	....	....	...	..	....	....	2	....	....	....	....	....	2	2	..	...	....	....	1	1	2	5	1	4	1	1	3	2	3	2	6	24	....
18th "	...	...	....	....	...	..	....	....	1	....	....	....	....	....	....	1	..	...	....	....	...	..	....	1	....	4	....	....	1	1	1	3	2	11	....
19th "	...	...	....	....	...	..	....	....	....	....	....	....	....	1	....	....	..	...	....	....	1	..	1	....	1	....	....	1	1	1	....	....	1	5	....
20th "	...	...	....	....	...	..	....	....	....	....	....	....	....	....	....	1	..	...	....	....	...	..	....	2	..	....	....	....	....	1	....	4	1	7	....
21st "	...	...	....	....	...	..	....	....	....	....	....	....	....	....	....	....	..	...	....	....	1	..	1	....	9	1	....	1	....	....	....	....	......	12	....
22d "	...	...	....	....	...	..	....	....	....	....	....	....	....	....	....	....	..	...	....	....	1	..	1	....	....	....	....	....	....	....	....	....	......	1	....
Between 10th and 20th	...	...	....	2	1	..	3	1	6	5	6	3	....	....	....	....	..	...	1	5	3	3	12	9	....	16	14	25	....	21	....	....	24	97	4
No. not stated	...	...	1	2	...	30	33	16	167	101	46	148	....	108	....	....	..	...	4	4	7	24	39	111	66	43	44	200	....	341	..	....	619	844	471
Total	154	476	5173	3019	299	32	9153	9252	9077	8868	8800	8491	8391	9225	7822	7709	48	171	4251	2843	418	31	7762	7511	7181	6785	6437	6135	6401	6706	5837	6014	86797	66769	479

TABLE XXVII.—DIVORCES GRANTED IN THE STATE OF CONNECTICUT BY THE SUPERIOR COURT DURING 1890.

CAUSES.	Hartford County.	New Haven County.	New London County.	Fairfield County.	Windham County.	Litchfield County.	Middlesex County.	Tolland County.	Total.
Adultery	15	33	9	15	5	5	1	4	87
Desertion	33	60	21	38	21	7	7	7	194
Intemperance	13	24	10	21	7	5	....	3	83
Cruelty	5	23	8	10	3	5	1	2	57
Intemperance and cruelty	7	20	6	8	1	1	....	....	43
Intemperance and desertion	1	1	....	....	1	...	....	....	3
Cruelty and desertion	2	1	....	....	....	....	....	....	3
Cruelty and adultery	....	1	....	1	1	....	....	....	3
Desertion and adultery	....	3	....	1	....	....	....	....	4
Total	76	166	54	94	39	23	9	16	477

Of the total divorces 19.7 per cent. only were granted on what are called scriptural reasons ; over 40 per cent. were granted for desertion alone ; 17.4 per cent. for intemperance alone ; nearly 12 per cent. for cruelty alone, and the remainder for associated causes.

TABLE XXVIII.—TABLE OF DIVORCES, 1878-1890.

COUNTIES.	TOTALS.												
	1890.	1889.	1888.	1887.	1886.	1885.	1884.	1683.	1882.	1881.	1880.	1879.	1878.
Hartford	76	93	81	69	80	75	74	77	66	80	49	51	74
New Haven	166	150	136	107	103	106	71	119	125	121	96	84	111
New London	54	62	61	45	43	28	44	47	40	38	32	35	52
Fairfield	94	146	65	71	63	94	84	101	86	78	63	63	74
Windham	39	21	17	33	38	27	22	30	16	36	33	27	28
Litchfield	23	29	33	22	24	22	18	25	23	35	32	24	23
Middlesex	9	12	16	12	12	12	22	34	23	6	11	14	18
Tolland	16	23	21	28	24	19	25	18	23	10	16	19	21
Total	477	536	430	387	387	383	360	451	392	404	332	316	401

TABLE XXIX.—SHOWING THE NUMBER OF DIVORCED PERSONS WHO HAVE REMARRIED IN 1890. BY COUNTIES.

COUNTIES.	Women.	Men.	
Hartford	44	31	During the year 1890 there were 477 divorces granted, or 954 individuals divorced; and there were 350 divorced persons who married again during the year.
New Haven	54	43	
New London	22	16	
Fairfield	34	22	
Windham	19	9	
Litchfield	21	12	
Middlesex	4	5	
Tolland	9	5	
Total	207	143	

TABLE XXX.—SHOWING THE NUMBER OF WIDOWS AND WIDOWERS WHO HAVE REMARRIED IN 1890. BY COUNTIES.

COUNTIES.	Widows.	Widowers.	
Hartford	97	173	Widowers remarry much more frequently than widows. But with divorced persons the women are more apt to remarry than the men, as appears by table XXIX.
New Haven	157	225	
New London	61	93	
Fairfield	87	154	
Windham	30	53	
Litchfield	32	51	
Middlesex	19	30	
Tolland	19	26	
Total	502	805	

DEATHS.

The registered mortality in 1890, exclusive of still-births, numbered 13,665, which was 1,136 more than in the preceding year. Upon a census population of 746,258 the death rate was 18.3 per 1,000 of living people.

The deaths of males on record numbered 7,016, of females 6,642, and of 7 decedents the sex is not stated.

The greatest mortality was recorded in January and reached 1,693. This high mortality in the beginning of the year is quite exceptional and was due to the prevalence of the endemic "Influenza" which was universally present throughout Connecticut, as well as other States during January.

The smallest mortality occurred in June, amounting to 934.

The annual rates represented by the deaths registered in each quarter were as follows:

						Total deaths.
First quarter,	21.0	per 1,000	of living	population,		3,919
Second	"	16.4	"	"	"	3,063
Third	"	19.8	"	"	"	3,696
Fourth	"	16.0	"	"	"	2,987
The annual death-rate was 18.3.						13,665

As compared with the preceding year the difference in mortality was almost wholly in the first quarter, in the last three quarters the death-rate was almost identical with that of the year before.

CAUSES OF DEATH.

The number of deaths registered of which no cause was given in 1890 was only 33 out of a total of 13,665, being 0.24 of total mortality. This is much the smallest percentage of omissions to give the cause of death since the practice of registration was begun. In the early part of the registration of mortality the omissions for several years numbered annually five and six hundred. The more complete assignment of causes is a very encouraging indication of greater attention to accurate registration on the part of both physicians and registrars.

The following table shows the improvement in this regard :

DEATHS FROM UNKNOWN OR UNSPECIFIED CAUSES OF DEATH AND PERCENTAGES, 1878–1890 (13 YEARS).

Year.	Total deaths.	Deaths from causes not stated.	Percentage of total mortality.
1878	9,352	624	6.6
1879	9,394	545	5.8
1880	10,408	536	5.1
1881	10,907	502	4.6
1882	11,662	390	3.3
1883	11,926	369	3.1
1884	11,351	377	3.4
1885	12,033	437	3.6
1886	11,616	305	2.6
1887	12,385	215	1.7
1888	12,980	99	.8
1889	12,529	71	.5
1890	13,665	33	.2

While some cause of death is assigned on almost every certificate, there is still too much use of the indefinite terms, Dropsy, Hemorrhage, Heart Failure, etc. In some instances the Superintendent is aware that more definite causes of death are given on the certificate by the physicians, but that the Registrar, ignorant of the importance of the subject or indifferent to it selects the indefinite word rather than the specific one for use in the abstract. This is another reason why the making up of an annual report of vital statistics from brief abstracts compiled by 168 different men should be abolished ; and why the annual report should be made by one person, expert in statistics, from the original certificates. The value of such a report would be vastly more accurate and many useful results could be obtained which are impossible under the present system.

CAUSES OF DEATH CONSIDERED BY CLASSES.

Class I.—Zymotic Diseases.

The deaths from zymotic diseases registered in 1890 amounted to 2,658, or 19.4 per cent. of the whole mortality. The deaths from this class of diseases were 56 more than in the year before.

From the causes of deaths as registered under the different classes, the percentage of each was as follows :

Classes.	Deaths.	Percentage of Total Mortality.
From the Zymotic	2,658	19.45
" Parasitic	----	----
" Dietetic	74	.54
" Constitutional	2,375	17.38
" Developmental	897	6.56
" Local	6,316	46.22
" Violent	560	4.09
" Unclassified or not stated	785	5.74
	13,665	100.00

The following table gives the percentage of deaths by classes* for 13 years, 1878–1890 :

Years.	Zymotic.	Parasitic.	Dietetic.	Constitutional.	Developmental.	Local.	Violence.
1878	22.61	----	.37	20.39	10.72	31.83	4.50
1879	18.72	----	.41	19.49	11.52	37.34	4.34
1880	22.82	.06	.45	19.12	10.36	37.85	3.95
1881	23.03	----	.57	20.27	11.79	36.03	3.53
1882	24.70	.02	.48	18.92	11.42	36.76	4.25
1883	23.69	.02	.38	18.43	11.78	35.47	4.20
1884	21.27	.02	.41	19.43	12.73	35.69	3.72
1885	19.36	.01	.41	18.40	12.34	38.71	4.11
1886	19.31	.01	.55	17.80	12.69	37.80	4.20
1887	21.40	.01	.38	17.45	7.99	40.45	4.24
1888	21.40	.09	.34	17.73	7.25	42.55	4.28
1889	20.7	.01	.45	17.72	7.98	41.44	4.63
1890	19.45	----	.54	17.38	6.56	46.22	4.09

A brief reference to some of the special diseases of the zymotic class may be of interest:

Small Pox.—There was a greater mortality from this disease in 1890 than has occurred in Connecticut in any one year since 1881. There were 12 deaths in the State, 10 of which were in Meriden. The starting point was the rag room of the Seymour Paper Company at Windsor Locks. From this as a center of infection the disease soon appeared in East Windsor, Woodstock, Waterbury and Meriden. In all the above towns except Meriden the disease was promptly isolated and all precautions taken to prevent its spread. But in Meriden the first case was hastily pronounced chicken pox, and given no further attention until the infection from it was the cause of outbreaks in several parts of the city.

* Excluding deaths from unclassified and unspecified, and also still-births.

A report of the circumstances of this epidemic was published in the last Annual Report of the Board.

All this occurred in the first quarter of the year, and the epidemic was controlled and the infection again extinguished throughout the State before the summer.

Measles.—This disease caused 18 deaths against 62 in the previous year. There were fatal cases in every county in the State excepting Litchfield and Middlesex. In two different towns in Hartford County with 2 deaths; in one town only in New Haven County with 2 deaths; in four towns in New London County with 4 deaths; in two towns in Fairfield County with 5 deaths; in three towns in Windham County with 4 deaths, and 1 death in Tolland County.

The popular belief that measles is a very safe disorder from which patients are almost sure to recover is quite wrong. Although it is admitted that it is not often directly fatal, yet it is well known to all observing medical practitioners that many lasting or even fatal diseases date from the time when the patient had had the measles. Hence the number of deaths attributed to this disease is not to be taken as a measure of its gravity.

Scarlet Fever was fatal in 67 instances during the year; which was 14 less than in the year before. The disease occurred in every county in the State with more or less fatal results. In no one town however was the mortality large. Local health boards are becoming conscious of their responsibility in outbreaks of contagious diseases, and in many towns make prompt and active effort to restrict them and are demonstrating their ability to control them.

The prevalence of scarlet fever in the counties was as follows:

Hartford	County,	12	deaths in	6	towns.
New Haven	"	17	"	6	"
New London	"	4	"	2	"
Fairfield	"	23	"	6	"
Windham	"	2	"	2	"
Litchfield	"	6	"	3	"
Middlesex	"	1	"	1	"
Tolland	"	2	"	1	"
State,		67		27	

Diphtheria and Croup are considered together for the reasons given in former reports. There were attributed to these diseases 557 deaths in 1890 against 717 in 1889 and 556 in 1888. The isolation of the specific germ which causes diphtheria is now believed to have been accomplished. The germ has strong vitality and is capable of being propagated outside of the human system. On that account the contagion of diphtheria may continue in an infected place for a long period, and may be carried in infected things for long distances. These facts should emphasize the great importance of entire and complete disinfection of every person and every thing that may have been in the presence of a diphtheritic patient.

The mortality from these diseases has occurred in counties as follows :

Hartford County,	140	deaths in	14	towns.
New Haven	"	210	"	14	"
New London	"	48	"	11	"
Fairfield	"	104	"	15	"
Windham	"	25	"	6	"
Litchfield	"	19	"	11	"
Middlesex	"	5	"	4	"
Tolland	"	6	"	4	"
		557		79	

The death-rate from this disease in the whole State was 0.74 per 1,000 of living population, as against 0.97 in the previous year.

Whooping Cough killed 137 in 1890 as against a death list of 92 in the year before. There were epidemics of limited extent in over 40 towns in the State, not confined to any particular section but distributed through all the counties.

Typhoid Fever was fatal in 312 instances during the year, which was 31 more than in the previous year.

The average number of deaths annually in Connecticut for the past 37 years, as shown by the following table, was 334. When it is considered how surely and easily the typhoid infection can be destroyed ; and when we also consider that the victims of this disease are largely, very largely, from those who are in the vigor and strength of adult youth, it seems incredible that an

enlightened community should go on passively and uncomplainingly suffering such sacrifice of human life.

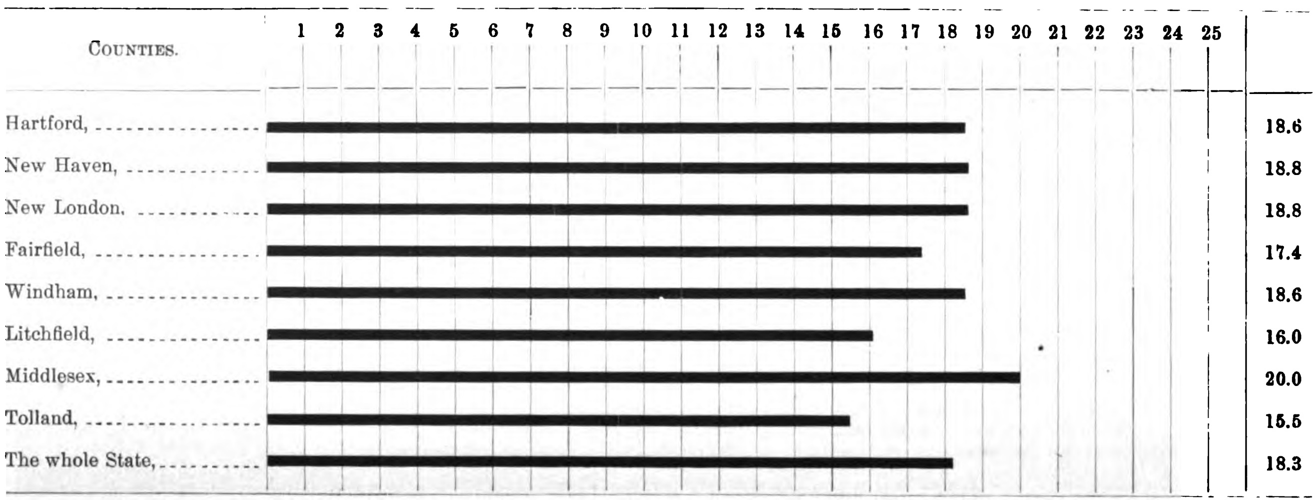
DEATHS FROM TYPHOID FEVER BY COUNTIES,

FOR 37 YEARS—1854-1890.

	Hartford County.	New Haven County.	New London County.	Fairfield County.	Windham County.	Litchfield County.	Middlesex County.	Tolland County.	TOTAL.	Per cent. to known causes.
1854	83	74	13	26	23	40	17	8	284	6.20
1855	58	62	32	15	25	28	27	20	273	5.50
1856	47	62	31	16	29	36	20	15	256	4.62
1857	61	58	28	15	27	35	29	14	267	4.56
1858	68	68	25	35	25	34	16	24	285	4.89
1859	78	55	25	48	26	36	17	22	307	5.30
1860	59	91	24	28	35	40	20	17	314	5.60
1861	92	74	32	34	42	32	23	31	360	5.25
1862	99	83	45	46	24	36	24	24	381	5.10
1863	112	96	61	39	19	45	28	27	427	5.71
1864	97	117	52	43	18	54	29	32	442	5.44
1865	129	97	80	50	60	57	42	27	548	7.79
1866	77	79	49	37	36	20	15	19	332	5.95
1867	117	105	38	38	25	46	19	28	416	6.39
1868	81	104	32	33	31	30	30	25	366	5.54
1869	84	130	35	59	38	48	38	30	458	5.63
1870	87	124	31	54	37	44	35	25	427	5.49
1871	64	111	25	53	31	34	29	5	352	4.93
1872	134	134	37	67	39	39	32	24	506	5.76
1873	114	117	37	43	33	41	24	21	430	5.00
1874	69	109	40	31	32	32	28	21	370	4.68
1875	103	119	38	45	40	44	32	28	449	3.11
1876	76	79	42	42	25	32	12	20	327	3.58
1877	80	80	33	40	25	26	17	28	329	3.32
1878	39	55	30	28	27	27	25	15	346	2.70
1879	30	24	34	26	14	15	5	11	169	1.77
1880	40	47	32	31	34	21	19	18	242	2.51
1881	52	68	23	32	30	18	19	15	257	2.45
1882	64	76	35	35	37	28	24	25	325	3.10
1883	49	118	26	29	28	18	14	20	292	2.14
1884	61	93	29	30	25	11	16	16	281	2.47
1885	66	56	22	31	18	19	8	7	227	1.09
1886	50	70	19	30	29	21	13	12	244	2.15
1887	33	51	15	37	19	14	12	14	195	1.16
1888	75	95	16	31	28	21	15	11	292	2.21
1889	62	62	26	68	20	21	6	16	281	2.25
1890	64	103	24	42	17	21	31	10	312	2.28

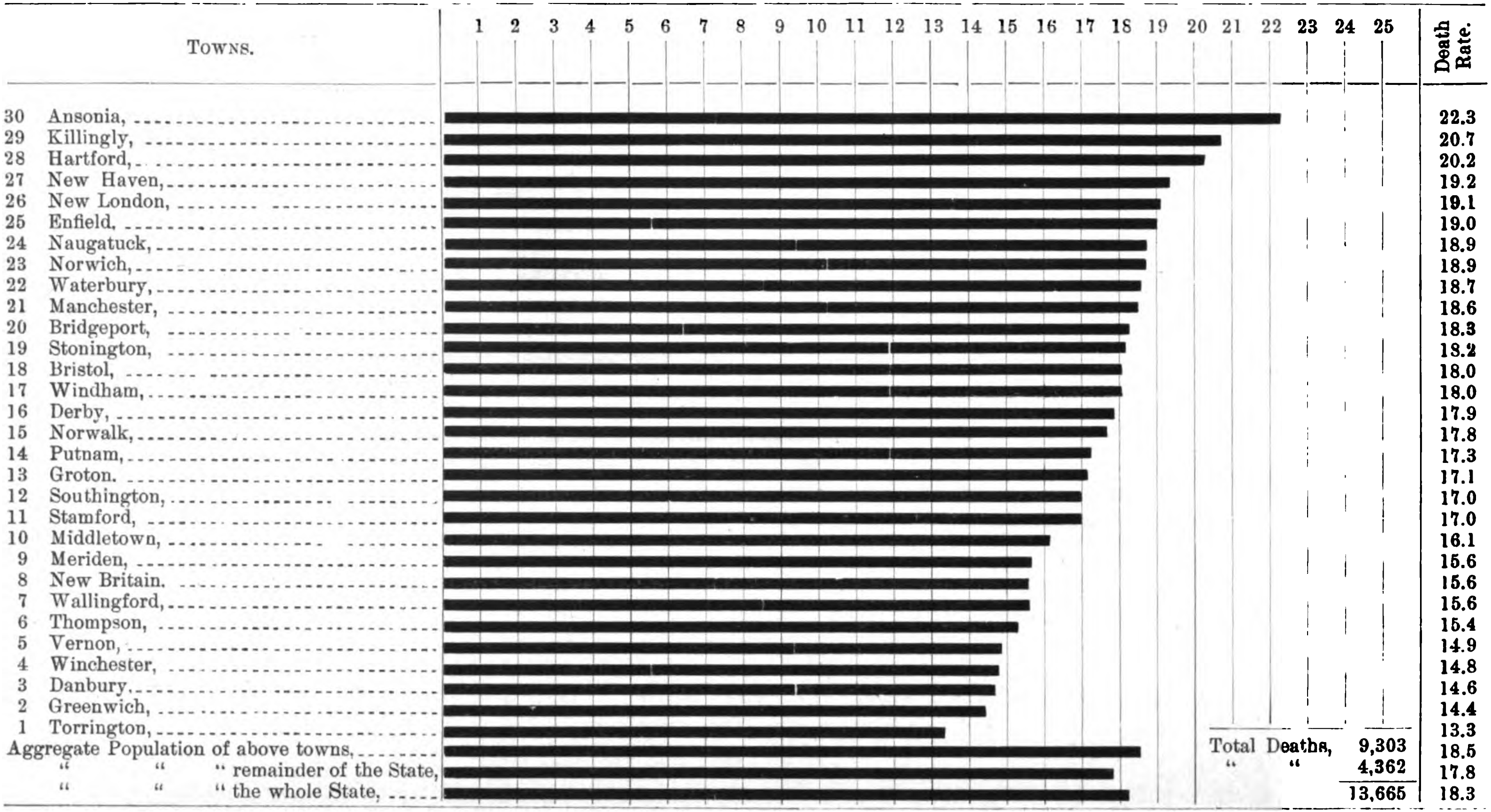
DEATH RATE.

DIAGRAM C, SHOWING THE NUMBER OF DEATHS TO EACH 1000 OF THE POPULATION IN EACH COUNTY IN CONNECTICUT.



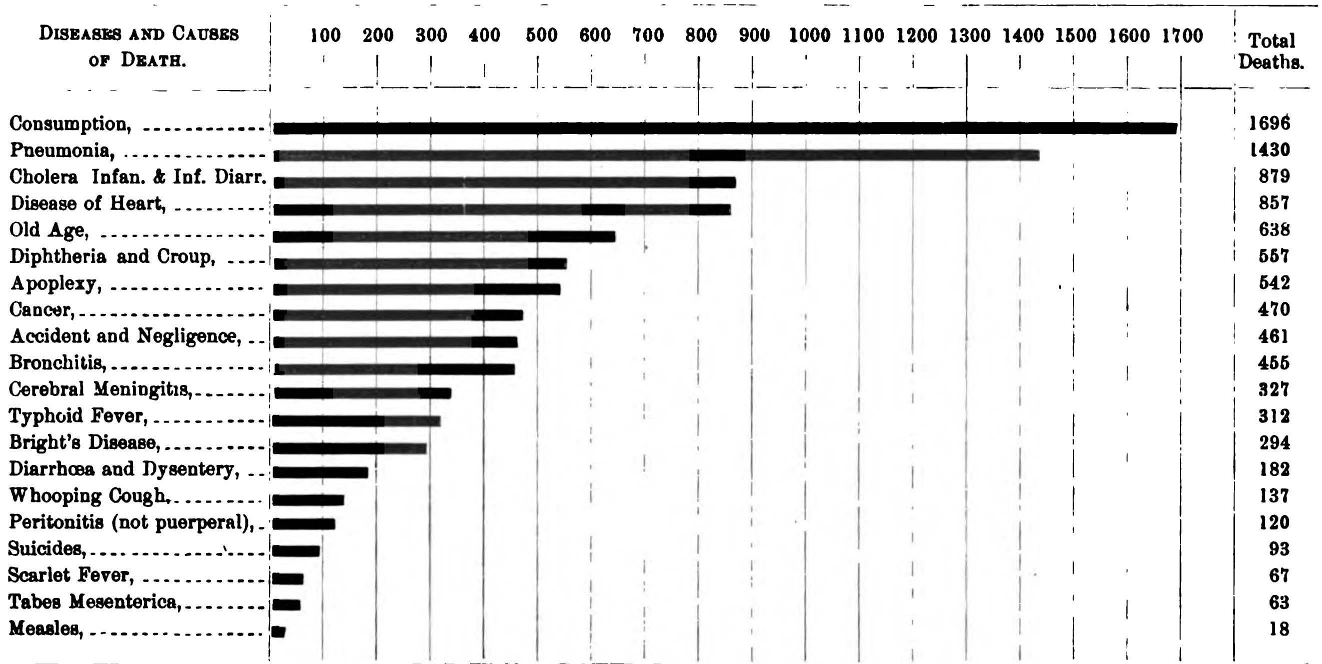
DEATH RATE.

DIAGRAM D, SHOWING THE NUMBER OF DEATHS IN EACH 1000 OF THE POPULATION OF EACH TOWN OF OVER 5000 INHABITANTS OF CONNECTICUT, AND OF THE REMAINDER OF THE STATE.



DEATH RATE.

DIAGRAM E, EXHIBITING THE COMPARATIVE MORTALITY BY ABSOLUTE NUMBERS FROM TWENTY PROMINENT CAUSES OF DEATH IN CONNECTICUT IN 1891.



MORTALITY FROM PROMINENT ZYMOTIC DISEASES—10 YEARS.

Years.	Small Pox.	Measles.	Scarlet Fever.	Typhoid Fever.	Whooping Cough.	Diphtheria.	Membranous Croup.	Infantile Diarrhœa.	Dysentery.	TOTAL.
	Diseases.									
1881	31	14	121	257	59	333	178	526	101	1620
1882	9	48	352	324	65	264	181	696	155	2094
1883	8	104	303	291	91	481	155	609	101	2143
1884	..	45	208	281	76	345	164	683	114	1916
1885	..	154	286	227	64	348	151	494	121	1845
1886	..	9	117	244	106	359	203	590	176	1804
1887	4	95	117	195	70	317	171	900	286	2155
1888	3	41	140	292	76	370	186	953	168	2229
1889	..	62	81	281	92	584	133	763	146	2142
1890	12	18	67	312	137	435	122	879	98	2080
Av'ge.	7.	59.	173.	270.	84.	364.	164.	709.	151.	2003.

The deaths from the above 9 principal zymotic diseases registered in 1890 form 15 per cent. of the deaths from all causes, and are equal to 27.8 deaths in every 10,000 of the population.

Class II.—Parasitic Diseases.

Although the diseases of this class are by no means insignificant in number or in importance, as giving occasion to much suffering, yet they are seldom fatal. Not a single death was attributed to this class of diseases in all Connecticut during the year.

Class III.—Dietetic Diseases.

There were 74 deaths registered in this class, all but two of which were certified to be due to the excessive use of alcoholic stimulants.

Class IV.—Constitutional Diseases.

The deaths registered as resulting from diseases termed constitutional numbered 2,375, that is 17 per cent. of the deaths from all causes. There were 2,220 registered in this class the year before.

Consumption, the most fatal of human diseases, in the light of recent discoveries ought not to be included in this class, but nevertheless is still retained there in accordance with long usage.

CLASS V.—DEVELOPMENTAL DISEASES.

In this class were registered 897.

Of these 638 were ascribed to old age, 200 to premature birth, 20 to Cyanosis, 24 to congenital malformations, and 15 to other causes.

Still-births are not included in this class but are enumerated separately. See Table XXII.

Still-births are not enumerated as deaths in any part of this report.

CLASS VI.—LOCAL DISEASES.

The deaths in this class always exceed those of any other. The registered number in 1890 was 6,316, or about 45 per cent. of the total mortality for the year. This class of diseases is subdivided into orders, according to the different portions of the body in which the diseases are located.

Diseases of Nervous System were registered as fatal in 1,839 instances, of which 542 were by apoplexy ; 327 by inflammation of the brain or its membranes ; 281 by "Convulsions," a term of very indefinite meaning ; 91 by softening of the brain ; 76 by insanity ; and 522 by the various other disorders of the nervous system.

Diseases of Circulatory System caused 1,088 deaths, of which 857 were recorded as from the various diseases of the heart, which is a little more than 6 per cent. of the total mortality in the State.

Diseases of the Respiratory System were the cause of death in 1,995 cases. Of these 1,430 were credited to pneumonia, 455 to bronchitis, and 31 to pleurisy.

Diseases of Digestive System.—This group contributed 749 to the total mortality of the year. They include 131 from enteritis, 120 from non-puerperal peritonitis, 155 from various diseases of the liver, 158 from diseases of stomach, etc.

Diseases of the Urinary System occasioned 507 deaths, of which Bright's disease and nephritis are recorded against 307 and 39 were ascribed to uræmia.

The remaining deaths from "Local Diseases" comprise 5 deaths from diseases of the eye, ear and nose, *Organs of Special Sense ;* only 1 of the *Lymphatic System ;* of the *Reproductive System* 28 ; of diseases and accidents incident to *Parturition* 79 ; of the *Locomotory System* 11 ; and of the *Integumentary System* 14.

MORTALITY FROM PRINCIPAL LOCAL DISEASES—10 YEARS.

Years.	Diseases.										
	Apoplexy.	Paralysis.	Insanity.	Convulsions.	Heart Disease.	Bronchitis.	Pneumonia.	Pleurisy.	Peritonitis.	Bright's Disease, Nephritis and other Kidney Diseases.	Total.
1881	308	252	58	258	492	96	713	16	161	216	2570
1882	298	302	55	253	545	92	804	23	119	233	2733
1883	274	298	71	279	586	174	905	22	119	245	2970
1884	309	295	40	102	617	204	694	17	78	300	2656
1885	311	301	59	314	679	245	1025	24	121	325	3404
1886	341	378	37	284	689	197	837	16	127	344	3150
1887	478	119	52	251	739	229	968	28	104	351	3314
1888	468	97	73	267	827	365	1107	27	115	398	3734
1889	498	82	47	287	704	324	915	38	122	402	3480
1890	542	78	76	281	857	455	1430	31	120	422	4292
Average	382.	209.	56.	258.	678.	238.	939.	24.	118.	323.	3231.

Class VII.—Violence.

The number of deaths caused by violence or negligence during the year as registered, was 560, or 20 less than in the year before; which is almost 5 per cent. of the total mortality of the year.

Accident and negligence caused 461; homicide and suicide caused 99; injuries on railroads resulted fatally in 146 cases; 71 were accidentally drowned.

Of the suicides 27 chose drowning and 16 hanging as a means of exit from life. The remaining 50 selected various modes.

Class VIII.—Unclassified.

This class is an enumeration of the deaths in which no cause is stated, or if stated it is in terms so general as to prevent proper classification. There were 785 in the list, in 33 of which no cause of death was given. The remaining 752 were described as due to "Tumors," "Debility," "Heart Failure" and like terms, which were not creditable to the physicians who rendered the certificates.

Statement of Births for the Ten Years ending December 31, 1890.

Counties.	Sex.	1881.	1882.	1883.	1884.	1885.	1886.	1887.	1888.	1889.	1890.	Total for 10 yrs.
Hartford	Male	1,491	1,488	1,700	1,680	1,744	1,623	1,646	1,663	1,743	1,691	16,469
	Female....	1,394	1,483	1,531	1,503	1,544	1,615	1,549	1,592	1,466	1,508	15,185
	Not stated	15	28	31	27	25	35	46	36	22	19	284
	Total....	2,900	2,999	3,262	3,210	3,313	3,273	3,241	3,291	3,231	3,218	31,938
New Haven..	Male	2,298	2,389	2,594	2,660	2,509	2,631	2,665	2,911	2,901	2,762	26,320
	Female....	2,049	2,080	2,333	2,367	2,243	2,298	2,521	2,602	2,758	2,781	24,032
	Not stated	13	45	55	39	20	17	21	28	19	42	299
	Total....	4,360	4,514	4,982	5,066	4,772	4,946	5,207	5,541	5,668	5,585	50,651
New London.	Male	839	788	839	808	784	785	826	840	778	811	8,098
	Female ...	748	794	761	793	754	804	790	809	749	753	7,755
	Not stated	16	7	8	17	19	15	16	6	8	3	115
	Total....	1,603	1,589	1,608	1,618	1,557	1,604	1,632	1,655	1,535	1,567	15,968
Fairfield	Male	1,323	1,361	1,426	1,314	1,382	1,545	1,737	1,729	1,766	1,871	15,454
	Female ...	1,108	1,282	1,324	1,303	1,357	1,456	1,497	1,564	1,610	1,794	14,295
	Not stated	37	24	38	41	46	39	50	43	16	27	361
	Total....	2,468	2,667	2,788	2,658	2,785	3,040	3,284	3,336	3,392	3,692	30,110
Windham....	Male	546	523	550	516	494	483	482	460	503	512	5,069
	Female ...	468	520	459	433	474	465	481	429	468	468	4,665
	Not stated	6	10	7	11	9	9	5	11	11	10	89
	Total....	1,020	1,053	1,016	960	977	957	968	900	982	990	9,823
Litchfield....	Male	544	502	563	535	507	417	525	467	534	545	5,239
	Female ...	485	439	472	469	433	518	465	442	462	474	4,559
	Not stated	6	14	14	8	11	4	8	5	7	7	84
	Total....	1,035	955	1,049	1,012	951	939	998	914	1,003	1,026	9,882
Middlesex ...	Male	356	333	375	416	359	365	385	378	400	404	3,771
	Female ...	345	341	310	329	340	339	358	351	396	393	3,502
	Not stated	2	3	3	4	10	3	4	3	4	....	36
	Total....	703	677	688	749	709	707	747	732	800	797	7,309
Tolland	Male	263	227	243	238	221	252	260	264	294	281	2,543
	Female ...	260	255	214	235	206	213	241	237	254	238	2,353
	Not stated	4	2	6	12	5	3	5	8	7	....	52
	Total....	527	484	463	485	432	648	506	509	555	519	4,948
Total for the State..	Male	7,660	7,611	8,200	8,167	8,000	8,201	8,526	8,712	8,919	8,877	82,963
	Female ...	6,857	7,194	7,404	7,432	7,351	7,608	7,902	8,026	8,163	8,409	76,346
	Not stated	99	133	162	155	145	125	155	140	94	108	1,320
Grand Total.	....	14,616	14,938	15,856	15,758	15,496	15,934	16,583	16,878	17,176	17,394	160,629

STATEMENT OF DEATHS FOR THE TEN YEARS ENDING DECEMBER 31, 1890.

COUNTIES.	SEX.	1881.	1882.	1883.	1884.	1885.	1886.	1887.	1888.	1889.	1890.	Total for 10 yrs.
Hartford	Male	1,188	1,263	1,422	1,192	1,294	1,238	1,269	1,382	1,310	1,411	12,969
	Female ...	1,170	1,249	1,264	1,178	1,246	1,161	1,125	1,312	1,245	1,335	12,285
	Not stated	12	8	20	8	17	10	1	2	2	....	80
	Total....	2,370	2,520	2,706	2,378	2,557	2,409	2,395	2,696	2,557	2,746	25,834
New Haven..	Male	1,425	1,671	1,602	1,622	1,666	1,742	1,850	1,869	1,769	2,053	17,269
	Female ...	1,365	1,529	1,608	1,521	1,521	1,587	1,728	1,712	1,607	1,894	16,072
	Not stated	30	27	27	18	16	2	4	3	7	1	135
	Total....	2,820	3,227	3,237	3,161	3,203	3,331	3,582	3,584	3,383	3,948	33,476
New London.	Male	657	623	712	686	682	623	670	638	644	753	6,688
	Female....	675	685	698	700	661	653	652	665	609	691	6,689
	Not stated	8	....	11	14	10	3	13	3	2	....	64
	Total....	1,340	1,308	1,421	1,400	1,353	1,279	1,335	1,306	1,255	1,444	13,441
Fairfield	Male	974	1,048	991	1,050	1,248	1,155	1,211	1,364	1,354	1,356	11,751
	Female ...	921	1,037	1,003	935	1,198	1,067	1,197	1,271	1,228	1,268	11,125
	Not stated	25	17	29	24	19	8	4	1	1	2	130
	Total....	1,920	2,102	2,023	2,009	2,465	2,230	2,412	2,636	2,583	2,626	23,006
Windham....	Male	353	354	348	313	357	350	364	353	401	409	3,602
	Female ...	344	318	329	346	331	380	403	404	439	434	3,728
	Not stated	4	7	8	7	9	5	39	4	2	....	85
	Total....	701	679	685	666	697	735	806	761	842	843	7,415
Litchfield....	Male	381	373	393	373	369	330	381	446	398	426	3,870
	Female ...	345	362	378	374	358	330	384	412	371	433	3,747
	Not stated	6	6	6	6	6	....	....	1	5	3	39
	Total....	732	741	777	753	733	660	765	859	774	862	7,656
Middlesex ...	Male	344	363	389	337	340	321	356	378	348	413	3,589
	Female ...	329	322	383	331	338	331	347	393	369	391	3,535
	Not stated	....	2	1	....	2	4	1	....	4	1	15
	Total....	673	687	773	668	680	656	704	772	721	805	7,139
Tolland......	Male	190	191	151	143	189	163	212	187	237	195	1,858
	Female ...	160	203	168	168	156	153	173	178	174	196	1,729
	Not stated	1	4	2	5	....	....	1	1	3	....	17
	Total. ..	351	398	321	316	345	316	386	366	414	391	3,604
Total for the State.......	Male	5,512	5,886	6,008	5,716	6,145	5,922	6,313	6,617	6,461	7,016	61,596
	Female....	5,309	5,705	5,831	5,553	5,809	5,662	6,009	6,348	6,042	6,642	58,910
	Not stated	86	71	104	82	79	32	63	15	26	7	565
Grand Total..	Total....	10,907	11,662	11,943	11,351	12,033	11,616	12,385	12,980	12,529	13,665	121,071

METEOROLOGICAL OBSERVATIONS.

Taken in the U. S. Signal Office in New Haven, Conn., since 1873.

Year.	Comparative Temperatures.												Annual Means.	Comparative Precipitation.												Total.
	Jan.	Feb.	March.	April.	May.	June.	July.	August.	Sept.	Oct.	Nov.	Dec.		Jan.	Feb.	March.	April.	May.	June.	July.	August.	Sept.	Oct.	Nov.	Dec.	
1873	24.7	26.9	33.2	44.2	55.9	67.0	72.3	69.0	62.7	52.7	34.0	32.6	47.9	7.55	3.49	4.05	5.79	6.27	2.07	1.55	9.90	2.12	7.18	4.75	4.44	59.16
1874	32.1	28.3	35.0	39.8	56.8	67.4	72.2	67.9	64.8	52.8	41.9	33.9	49.4	4.29	3.86	1.34	7.89	4.92	3.41	4.90	12.99	4.07	1.86	3.44	2.85	55.82
1875	24.2	24.5	32.4	43.0	58.2	67.9	72.5	71.9	62.3	52.9	37.8	32.7	48.4	2.72	3.98	3.24	3.28	2.71	3.50	4.42	5.56	2.10	3.18	7.44	1.39	43.52
1876	34.2	31.2	35.5	47.3	58.8	72.1	77.2	72.4	61.3	51.6	44.2	25.9	51.0	1.54	4.29	10.15	7.65	3.12	1.86	11.05	1.20	5.34	1.07	4.43	2.38	53.98
1877	28.3	35.9	38.0	48.4	59.5	69.5	74.0	73.9	65.6	55.0	46.0	39.9	52.8	2.60	1.07	8.09	3.44	2.14	6.17	2.37	5.69	1.13	10.09	7.11	1.46	51.36
1878	31.9	34.2	43.5	52.4	58.7	66.1	75.1	72.0	65.6	57.0	42.9	34.4	52.8	6.80	6.40	4.18	5.08	3.75	2.62	2.53	4.93	7.67	2.33	6.33	5.50	58.12
1879	27.5	27.6	37.7	46.2	61.4	69.3	73.2	69.6	62.0	59.0	42.3	36.1	51.0	2.69	3.89	5.82	6.08	3.22	4.62	9.50	9.40	2.13	1.41	2.33	4.41	55.50
1880	37.7	35.8	36.7	49.3	64.3	70.5	73.5	70.1	64.3	52.0	40.0	27.8	51.8	3.45	3.80	5.68	3.69	1.24	1.21	4.90	8.14	3.73	4.07	2.82	3.49	46.52
1881	21.7	26.9	36.1	41.1	58.5	62.5	70.7	71.2	69.6	55.9	43.1	37.6	49.8	4.79	6.17	10.42	1.71	3.89	5.14	3.53	2.51	1.45	2.78	4.18	4.75	51.32
1882	26.8	31.6	86.9	43.5	51.4	66.2	71.6	69.7	64.5	55.3	37.8	29.0	48.7	5.91	4.52	3.59	1.55	5.05	2.74	3.03	0.26	13.43	3.54	1.31	2.99	47.92
1883	23.8	27.6	29.9	44.2	56.5	68.3	71.1	67.3	60.1	49.0	42.1	29.7	47.5	3.60	5.00	1.64	2.23	4.52	1.83	5.67	1.26	2.43	5.87	1.56	3.85	39.46
1884	23.2	31.7	33.6	44.9	55.9	66.8	67.8	69.1	56.4	53.2	40.9	31.5	48.8	4.63	5.57	4.15	2.36	3.32	5.26	5.89	5.60	1.41	2.41	2.24	6.41	49.33
1885	26.8	19.7	26.9	46.0	54.9	65.2	72.1	67.8	60.7	51.6	42.4	33.3	47.3	4.05	3.15	1.19	2.31	2.61	1.43	2.51	8.13	0.77	5.37	3.49	3.31	38.32
1886	25.4	26.1	34.4	48.3	56.6	63.2	70.1	68.2	63.2	52.8	42.7	27.3	48.2	3.53	5.95	3.20	3.21	2.74	2.84	4.61	4.56	2.35	1.95	3.83	3.47	42.32
1887	25.2	29.8	31.3	44.4	60.5	65.5	74.5	67.8	59.7	51.1	40.4	32.6	48.6	4.24	6.22	4.22	2.75	0.18	5.62	4.66	4.80	2.21	3.24	2.85	3.09	44.08
1888	20.5	27.8	29.4	44.0	55.0	67.8	68.3	69.2	59.4	46.4	41.4	31.6	46.7	5.48	3.16	7.46	2.57	6.03	2.15	1.76	7.10	7.68	6.46	4.73	5.68	60.26
1889	34.2	25.0	38.7	48.6	59.6	67.4	70.0	68.5	63.0	48.8	44.2	38.8	50.6	4.47	2.08	1.44	4.01	3.81	3.17	17.08	4.38	4.98	3.96	7.78	2.62	59.78
1890	35.4	35.5	34.2	47.0	56.8	65.9	69.4	69.1	62.8	51.3	41.7	26.6	49.6	3.07	3.19	6.60	2.89	4.24	3.12	6.59	2.67	5.38	7.63	.67	2.90	48.95
Mean, 18 yrs.	27.9	29.2	34.6	45.7	57.7	67.1	72.0	69.7	63.2	52.7	41.4	32.4	49.5	4.21	4.21	4.80	3.80	3.54	3.26	5.36	5.50	3.91	4.13	3.96	3.61	50.32

METEOROLOGICAL RECORD.—PREPARED BY HENRY J. COX, U. S. SIGNAL OFFICER.

Observations taken at the U. S. Signal Office in New Haven, Conn., during 1890.

MONTH. 1890.	Barometric Pressure.				Temperature.				Humid	Precipitation.		Wind.		
	Monthly Mean Barometer.	Highest Barometer during month.	Lowest Barometer during month.	Range of Pressure during month.	Monthly Mean Temperature.	Highest Temperature.	Lowest Temperature.	Range.	Monthly Mean Rel. Humidity, Per cent.	Rain and Melted Snow.	No. days .01 in. or more of Rain or Melted Snow fell.	Prevailing Direction.	Highest Velocity.	Total number of miles of movement.
January	30.20	30.83	29.49	1.34	35.4	65	10	55	78.8	3.07	17	S. W.	60	6684
February	30.12	30.67	29.48	1.19	35.5	67	10	57	81.0	3.19	16	N. W.	39	5226
March	30.02	30.54	29.46	1.08	34.2	67	4	63	78.2	6.60	18	N. W.	34	5913
April	30.11	30.60	29.47	1.13	47.0	70	24	46	71.6	2.89	9	N. W.	34	4930
May	29.99	30.33	29.63	.70	56.8	79	38	41	79.8	4.24	14	S.	30	4883
June	29.98	30.29	29.72	.57	65.9	88	48	40	75.0	3.12	11	S.	26	4245
July	30.03	30.25	29.73	.52	69.4	91	49	42	75.2	6.59	10	S. W.	25	4567
August	30.01	30.24	29.55	.69	69.1	85	47	38	81.6	2.67	10	N. W.	27	4798
September	30.13	30.39	29.74	.65	62.8	80	36	44	85.3	5.38	13	N. W.	25	3933
October	29.90	30.39	29.35	1.04	51.3	73	33	40	80.4	7.63	18	N. E.	40	4750
November	30.05	30.36	29.59	.77	41.7	69	17	52	76.0	.67	7	N. W.	44	5190
December	30.05	30.60	29.45	1.15	26.6	51	5	46	73.4	2.90	13	N. E.	52	7388
	Mean 36.05	Highest 30.83	Lowest 29.35	Range 1.48	Mean 49.6	Highest 91	Lowest 4	Range 87	Mean 78.0	Total 48.95	Total 156	N. W.	Highest 60	Total 62,507

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